

INCH-POUND
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SUPERSEDING
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MILITARY SPECIFICATION  
MICROCIRCUITS, LINEAR, ADJUSTABLE, POSITIVE, VOLTAGE REGULATORS, MONOLITHIC SILICON

This specification is approved for use by all Departments and Agencies of the Department of Defense.

Reactivated for new design as of 10 February 2004. May be used for either new or existing design acquisition.

The requirements for acquiring the product herein shall consist of this specification sheet and MIL-PRF-38535

## 1. SCOPE

1.1 Scope. This specification covers the detail requirements for three and four terminal monolithic silicon, adjustable, positive, voltage regulators. Two product assurance classes and a choice of case outlines and lead finish are provided for each type and are reflected in the complete part number. For this product, the requirements of MIL-M-38510 have been superseded by MIL-PRF-38535, (see 6.3).

1.2 Part or Identifying Number (PIN). The PIN is in accordance with MIL-PRF-38535, and as specified herein.

1.2.1 Device types. The device types should be as shown in the following:

Device type	Circuit	Case outline letter
01	4-terminal voltage regulator, 5 volts $\leq$ $V_O$ $\leq$ 30 volts at 0.5 A	X
02	4-terminal voltage regulator, 5 volts $\leq$ $V_O$ $\leq$ 30 volts at 1.5 A	Y
03	3-terminal voltage regulator, 1.25 volts $\leq$ $V_O$ $\leq$ 37 volts at 0.5 A	X
04	3-terminal voltage regulator, 1.25 volts $\leq$ $V_O$ $\leq$ 37 volts at 1.5 A	Y
05	3-terminal voltage regulator, 1.25 volts $\leq$ $V_O$ $\leq$ 37 volts at 3.0 A	Y
06	3-terminal voltage regulator, 1.25 volts $\leq$ $V_O$ $\leq$ 37 volts at 5.0 A	Y

1.2.2 Device class. The device class is the product assurance level as defined in MIL-PRF-38535.

Comments, suggestions, or questions on this document should be addressed to: Commander, Defense Supply Center Columbus, ATTN: DSCC-VAS, 3990 East Broad St., Columbus, OH 43216-5000, or emailed to [linear@dsc.dla.mil](mailto:linear@dsc.dla.mil). Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at [www.dodssp.daps.mil](http://www.dodssp.daps.mil).

1.2.3 Case outlines. The case outlines are as designated in MIL-STD-1835 and as follows:

<u>Outline letter</u>	<u>Descriptive designator</u>	<u>Terminals</u>	<u>Device types</u>	<u>Package style</u>
X	See figure 1	4	01	Can
Y	See figure 2	4	02	Flange mount
X	See figure 3	3	03	Can
Y	See figure 4	2	04,05,06	Flange mount

### 1.3 Absolute maximum ratings.

Input voltage (device types 01 and 02) .....	40 V
Input-output differential voltage (device types 03 and 04) .....	40 V
(device types 05 and 06) .....	35 V
Lead temperature (soldering, 60 seconds) .....	+300°C
Junction temperature ( $T_J$ ) .....	+150°C <u>1/</u>
Storage temperature range .....	-65°C to +150°C

### 1.4 Recommended operating conditions.

#### Input voltage range:

Device types 01 and 02 .....	8 V dc to 38 V dc
Device types 03 and 04 .....	4.25 V dc to 41.25 V dc
Device types 05 and 06 .....	4.25 V dc to 36.25 V dc

Ambient operating temperature range ( $T_A$ ) .....

### 1.5 Power and thermal characteristics.

$T_A = T_S$	Case	Max $\theta_{JA}$	Maximum $P_D$ without heat sink	Max $\theta_{JC}$	Maximum $P_D$ with heat sink	Max $\theta_{C-S}$ <u>2/</u>
125°C <u>3/</u>	X	140°C/W	0.18 W	40°C/W	0.5 W	10°C/W
	Y	35°C/W	0.71 W	4°C/W <u>4/</u>	5.6 W <u>5/</u>	0.5°C/W
25°C <u>3/</u>	X	140°C/W	0.89 W	40°C/W	2.50 W	10°C/W
	Y	35°C/W	3.60 W	4°C/W <u>4/</u>	28.00 W <u>6/</u>	0.5°C/W
-55°C <u>3/</u>	X	140°C/W	1.50 W	40°C/W	4.00 W	10°C/W
	Y	35°C/W	5.80 W	4°C/W <u>4/</u>	45.00 W <u>6/</u>	0.5°C/W

1/ The device is protected by a thermal shutdown circuit which is designed to turn off the output transistor whenever the device junction temperature is in excess of 150°C.

2/ This value represents the maximum allowable thermal impedance of a heat sink to remain within the thermal ratings.

3/ Based on  $T_J = 150^\circ\text{C}$  and specified values of  $\theta_{JA}$  and  $\theta_{JC}$ .

4/ Maximum  $\theta_{JC}$  at all temperatures (for case Y only) = 1.5°C/W for device type 05 and 1.0°C/W for device type 06.

5/ Power dissipation ( $P_D$ ) at 125°C (for case Y only) = 12.5 W for device type 05 and 16.6 W for device type 06.

6/ Power dissipation ( $P_D$ ) at -55°C and +25°C (for case Y only) = 30 W for device type 05 and 50 W for device type 06.

## 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

### 2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

#### DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-PRF-38535 - Integrated Circuits (Microcircuits) Manufacturing, General Specification for.

#### DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-883 - Test Method Standard for Microelectronics.

MIL-STD-1835 - Interface Standard Electronic Component Case Outlines.

(Copies of these documents are available online at <http://assist.daps.dla.mil:quicksearch/> or [www.dodssp.daps.mil](http://www.dodssp.daps.mil) or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein, the text of this document shall take precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

## 3. REQUIREMENTS

3.1 Qualification. Microcircuits furnished under this specification shall be products that are manufactured by a manufacturer authorized by the qualifying activity for listing on the applicable qualified manufacturers list before contract award (see 4.3 and 6.4).

3.2 Item requirements. The individual item requirements shall be in accordance with MIL-PRF-38535 and as specified herein or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not affect the form, fit, or function as described herein.

3.3 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-PRF-38535 and herein.

3.3.1 Block diagram and terminal connections. The block diagrams and terminal connections shall be as specified on figures 5 through 8.

3.3.2 Schematic circuits. The schematic circuits shall be maintained by the manufacturer and made available to the qualifying activity and the preparing activity (DSCC-VA) upon request.

3.3.3 Case outlines. The case outlines shall be as specified in 1.2.3 and on figures 1, 2, 3, and 4.

3.4 Lead material and finish. Lead material and finish shall be in accordance with MIL-PRF-38535 (see 6.6).

3.5 Electrical performance characteristics. Unless otherwise specified, the electrical performance characteristics are as specified in table I and apply over the full operating ambient temperature range of  $-55^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ .

3.5.1 Stability. If the device is located an appreciable distance from the power supply filter, a solid tantalum bypass capacitor should be connected as close to the device  $V_{CC}$  input as possible to suppress oscillation. A solid tantalum bypass capacitor is recommended on the device output. Since load currents of less than 5 milliamperes may result in a loss of voltage regulation, regulators should be preloaded with 5 milliamperes of load current in lightly loaded applications. In applications where fast rising high current pulses are present, additional output capacitance of 20  $\mu\text{F}$  or more shall be used.

3.5.2 Test limit. The test limits specified in tables I and III apply only for the stated test conditions (example, 2 percent duty cycle), which essentially keep the junction temperature constant. In most applications the junction temperature will greatly exceed the  $25^{\circ}\text{C}$  ambient or sink temperature; thus devices may not perform within the  $25^{\circ}\text{C}$  specified limits.

3.6 Electrical test requirements. Electrical test requirements for each device class shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table III.

3.7 Marking. Marking shall be in accordance with MIL-PRF-38535.

3.8 Microcircuit group assignment. The devices covered by this specification shall be in microcircuit group number 52 (see MIL-PRF-38535, appendix A).

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ 2/ $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ see figure 9 and 3.5 unless otherwise specified		Device type	Limits		Unit
		Input voltage	Load current		Min	Max	
Output voltage	$V_{\text{OUT}}$	$V_{\text{IN}} = 8 \text{ V}$	$I_L = -5 \text{ mA}, -500 \text{ mA}$	01	4.75	5.25	V
		$V_{\text{IN}} = 30 \text{ V}$	$I_L = -5 \text{ mA}, -50 \text{ mA}$		4.75	5.25	
		$V_{\text{IN}} = 38 \text{ V}$	$I_L = -500 \text{ mA}$		28.5	31.5	
		$V_{\text{IN}} = 10 \text{ V},$ $T_A = 150^{\circ}\text{C}$	$I_L = -5 \text{ mA}$		4.75	5.25	
Line regulation	$V_{\text{RLINE}}$	$8 \text{ V} \leq V_{\text{IN}} \leq 30 \text{ V}$	$I_L = -50 \text{ mA}$	01	-150	150	mV
		$8 \text{ V} \leq V_{\text{IN}} \leq 25 \text{ V}$	$I_L = -350 \text{ mA}$		-50	50	
Load regulation	$V_{\text{RLOAD}}$	$V_{\text{IN}} = 10 \text{ V}$	$-500 \text{ mA} \leq I_L \leq -5 \text{ mA}$	01	-100	100	mV
		$V_{\text{IN}} = 30 \text{ V}$	$-50 \text{ mA} \leq I_L \leq -5 \text{ mA}$		-150	150	
Thermal regulation	$V_{\text{RTH}}$	$V_{\text{IN}} = 15 \text{ V},$ $T_A = 25^{\circ}\text{C}$	$I_L = -500 \text{ mA}$	01	-50	50	mV
Standby current drain	$I_{\text{SCD}}$	$V_{\text{IN}} = 10 \text{ V}$	$I_L = -5 \text{ mA}$	01	-7.0	-0.5	mA
		$V_{\text{IN}} = 30 \text{ V}$	$I_L = -5 \text{ mA}$		-8.0	-0.5	
Standby current drain change versus line voltage	$\Delta I_{\text{SCD}}$ (LINE)	$8 \text{ V} \leq V_{\text{IN}} \leq 30 \text{ V}$	$I_L = -5 \text{ mA}$	01	-1.0	1.0	mA
Standby current drain change versus load current	$\Delta I_{\text{SCD}}$ (LOAD)	$V_{\text{IN}} = 10 \text{ V}$	$-500 \text{ mA} \leq I_L \leq -5 \text{ mA}$	01	-0.5	0.5	mA
Control pin current	$I_{\text{CTL}}$	$V_{\text{IN}} = 10 \text{ V},$ $T_A = 25^{\circ}\text{C}$	$I_L = -350 \text{ mA}$	01	-5.0	-0.01	$\mu\text{A}$
		$V_{\text{IN}} = 10 \text{ V},$ $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	$I_L = -350 \text{ mA}$		-8.0	-0.01	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions <u>1/2/</u> $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ see figure 9 and 3.5 unless otherwise specified		Device type	Limits		Unit
		Input voltage	Load current		Min	Max	
Output short circuit current	I <sub>OS1</sub>	V <sub>IN</sub> = 10 V		01	-2.0	-0.50	A
	I <sub>OS2</sub>	V <sub>IN</sub> = 30 V			-1.0	-0.01	
Output voltage recovery after output short circuit current	V <sub>OUT</sub> (RECOV)	V <sub>IN</sub> = 10 V, <u>3/</u> after I <sub>OS1</sub>	R <sub>L</sub> = 10 Ω, C <sub>L</sub> = 20 μF	01	4.75	5.25	V
		V <sub>IN</sub> = 30 V, <u>3/</u> after I <sub>OS2</sub>	R <sub>L</sub> = 1 kΩ		4.75	5.25	
Voltage start-up	V <sub>START</sub>	V <sub>IN</sub> = 8 V	R <sub>L</sub> = 10 Ω, C <sub>L</sub> = 20 μF	01	4.75	5.25	V
Ripple rejection	ΔV <sub>IN</sub> / ΔV <sub>OUT</sub>	V <sub>IN</sub> = 10 V, <u>4/</u> e <sub>i</sub> = 1 Vrms, at f = 2400 Hz	I <sub>L</sub> = -125 mA, T <sub>A</sub> = 25°C, see figure 11	01	45		dB
Output noise voltage	V <sub>NO</sub>	V <sub>IN</sub> = 10 V, <u>4/</u> see figure 12	I <sub>L</sub> = -50 mA, T <sub>A</sub> = 25°C	01		125	μVrms
Line transient response	ΔV <sub>OUT</sub> / ΔV <sub>IN</sub>	V <sub>IN</sub> = 10 V, <u>5/</u> ΔV <sub>IN</sub> = 3.0 V, see figure 13	I <sub>L</sub> = -5 mA, T <sub>A</sub> = 25°C	01		30	mV/V
Load transient response	ΔV <sub>OUT</sub> / ΔI <sub>L</sub>	V <sub>IN</sub> = 10 V, <u>5/</u> see figure 14	I <sub>L</sub> = -50 mA, ΔI <sub>L</sub> = -200 mA T <sub>A</sub> = 25°C	01		2.5	mV/mA

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions 1/ 2/ $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ see figure 9 and 3.5 unless otherwise specified		Device type	Limits		Unit
		Input voltage	Load current		Min	Max	
Output voltage	$V_{\text{OUT}}$	$V_{\text{IN}} = 8 \text{ V}$	$I_L = -5 \text{ mA}, -1 \text{ A}$	02	4.75	5.25	V
		$V_{\text{IN}} = 30 \text{ V}$	$I_L = -5 \text{ mA}, -100 \text{ mA}$		4.75	5.25	
		$V_{\text{IN}} = 38 \text{ V}$	$I_L = -1 \text{ A}$		28.5	31.5	
		$V_{\text{IN}} = 10 \text{ V},$ $T_A = 150^{\circ}\text{C}$	$I_L = -5 \text{ mA}$		4.75	5.25	
Line regulation	$V_{\text{RLINE}}$	$8 \text{ V} \leq V_{\text{IN}} \leq 30 \text{ V}$	$I_L = -100 \text{ mA}$	02	-150	150	mV
		$8 \text{ V} \leq V_{\text{IN}} \leq 25 \text{ V}$	$I_L = -500 \text{ mA}$		-50	50	
Load regulation	$V_{\text{RLOAD}}$	$V_{\text{IN}} = 10 \text{ V}$	$-1 \text{ A} \leq I_L \leq -5 \text{ mA}$	02	-100	100	mV
		$V_{\text{IN}} = 30 \text{ V}$	$-100 \text{ mA} \leq I_L \leq -5 \text{ mA}$		-150	150	
Thermal regulation	$V_{\text{RTH}}$	$V_{\text{IN}} = 15 \text{ V},$ $T_A = 25^{\circ}\text{C}$	$I_L = -1 \text{ A}$	02	-50	50	mV
Standby current drain	$I_{\text{SCD}}$	$V_{\text{IN}} = 10 \text{ V}$	$I_L = -5 \text{ mA}$	02	-7.0	-0.5	mA
		$V_{\text{IN}} = 30 \text{ V}$	$I_L = -5 \text{ mA}$		-8.0	-0.5	
Standby current drain change versus line voltage	$\Delta I_{\text{SCD}}$ (LINE)	$8 \text{ V} \leq V_{\text{IN}} \leq 30 \text{ V}$	$I_L = -5 \text{ mA}$	02	-1.0	1.0	mA
Standby current drain change versus load current	$\Delta I_{\text{SCD}}$ (LOAD)	$V_{\text{IN}} = 10 \text{ V}$	$-1 \text{ A} \leq I_L \leq -5 \text{ mA}$	02	-0.5	0.5	mA
Control pin current	$I_{\text{CTL}}$	$V_{\text{IN}} = 10 \text{ V},$ $T_A = 25^{\circ}\text{C}$	$I_L = -500 \text{ mA}$	02	-5.0	-0.01	$\mu\text{A}$
		$V_{\text{IN}} = 10 \text{ V},$ $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	$I_L = -500 \text{ mA}$		-8.0	-0.01	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions <u>1/2/</u> $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ see figure 9 and 3.5 unless otherwise specified		Device type	Limits		Unit
		Input voltage	Load current		Min	Max	
Output short circuit current	I <sub>OS1</sub>	V <sub>IN</sub> = 10 V		02	-4.0	-1.00	A
	I <sub>OS2</sub>	V <sub>IN</sub> = 30 V			-2.0	-0.02	
Output voltage recovery after output short circuit current	V <sub>OUT</sub> (RECOV)	V <sub>IN</sub> = 10 V, <u>3/</u> after I <sub>OS1</sub>	R <sub>L</sub> = 5 Ω, C <sub>L</sub> = 20 μF	02	4.75	5.25	V
		V <sub>IN</sub> = 30 V, <u>3/</u> after I <sub>OS2</sub>	R <sub>L</sub> = 5 kΩ		4.75	5.25	
Voltage start-up	V <sub>START</sub>	V <sub>IN</sub> = 8 V	R <sub>L</sub> = 5 Ω, C <sub>L</sub> = 20 μF	02	4.75	5.25	V
Ripple rejection	ΔV <sub>IN</sub> / ΔV <sub>OUT</sub>	V <sub>IN</sub> = 10 V, <u>4/</u> e <sub>i</sub> = 1 Vrms, at f = 2400 Hz	I <sub>L</sub> = -350 mA, T <sub>A</sub> = 25°C, see figure 11	02	45		dB
Output noise voltage	V <sub>NO</sub>	V <sub>IN</sub> = 10 V, <u>4/</u> see figure 12	I <sub>L</sub> = -100 mA, T <sub>A</sub> = 25°C	02		250	μVrms
Line transient response	ΔV <sub>OUT</sub> / ΔV <sub>IN</sub>	V <sub>IN</sub> = 10 V, <u>5/</u> ΔV <sub>IN</sub> = 3.0 V, see figure 13	I <sub>L</sub> = -5 mA, T <sub>A</sub> = 25°C	02		30	mV/V
Load transient response	ΔV <sub>OUT</sub> / ΔI <sub>L</sub>	V <sub>IN</sub> = 10 V, <u>5/</u> see figure 14	I <sub>L</sub> = -100 mA, ΔI <sub>L</sub> = -400 mA T <sub>A</sub> = 25°C	02		2.5	mV/mA

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions <u>1/2/</u> $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ see figure 9 and 3.5 unless otherwise specified		Device type	Limits		Unit
		Input voltage	Load current		Min	Max	
Output voltage	$V_{\text{OUT}}$	$V_{\text{IN}} = 4.25 \text{ V}$	$I_L = -5 \text{ mA}, -500 \text{ mA}$	03	1.20	1.30	V
		$V_{\text{IN}} = 41.25 \text{ V}$	$I_L = -5 \text{ mA}, -50 \text{ mA}$		1.20	1.30	
		$V_{\text{IN}} = 6.25 \text{ V},$ $T_A = 150^{\circ}\text{C}$	$I_L = -5 \text{ mA}$		1.20	1.30	
Line regulation	$V_{\text{RLINE}}$	$4.25 \text{ V} \leq V_{\text{IN}} \leq 41.25 \text{ V},$ $T_A = 25^{\circ}\text{C}$	$I_L = -5 \text{ mA}$	03	-9	9	mV
		$4.25 \text{ V} \leq V_{\text{IN}} \leq 41.25 \text{ V},$ $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	$I_L = -5 \text{ mA}$		-23	23	
Load regulation	$V_{\text{RLOAD}}$	$V_{\text{IN}} = 6.25 \text{ V},$ $T_A = 25^{\circ}\text{C}$	$-500 \text{ mA} \leq I_L \leq -5 \text{ mA}$	03	-12	12	mV
		$V_{\text{IN}} = 6.25 \text{ V},$ $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	$-500 \text{ mA} \leq I_L \leq -5 \text{ mA}$		-12	12	
		$V_{\text{IN}} = 41.25 \text{ V},$ $T_A = 25^{\circ}\text{C}$	$-500 \text{ mA} \leq I_L \leq -5 \text{ mA}$		-12	12	
		$V_{\text{IN}} = 41.25 \text{ V},$ $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	$-500 \text{ mA} \leq I_L \leq -5 \text{ mA}$		-12	12	
Thermal regulation	$V_{\text{RTH}}$	$V_{\text{IN}} = 14.6 \text{ V},$ $T_A = 25^{\circ}\text{C}$	$I_L = -500 \text{ mA}$	03	-12	12	mV
Adjust pin current	$I_{\text{ADJ}}$	$V_{\text{IN}} = 4.25 \text{ V}$	$I_L = -5 \text{ mA}$	03	-100	-15	$\mu\text{A}$
		$V_{\text{IN}} = 41.25 \text{ V}$	$I_L = -5 \text{ mA}$		-100	-15	
Adjust pin current change versus line voltage	$\Delta I_{\text{ADJ}}$ (LINE)	$4.25 \text{ V} \leq V_{\text{IN}} \leq 41.25 \text{ V}$	$I_L = -5 \text{ mA}$	03	-5	5	$\mu\text{A}$

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions <u>1/ 2/</u> $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ see figure 9 and 3.5 unless otherwise specified		Device type	Limits		Unit
		Input voltage	Load current		Min	Max	
Adjust pin current change versus load current	$\Delta I_{\text{ADJ}}$ (LOAD)	$V_{\text{IN}} = 6.25 \text{ V}$	$-500 \text{ mA} \leq I_L \leq -5 \text{ mA}$	03	-5	5	$\mu\text{A}$
Minimum load current	$I_Q$	$4.25 \text{ V} \leq V_{\text{IN}} \leq 14.25 \text{ V}$ , forced $V_{\text{OUT}} = 1.4 \text{ V}$		03	-3.00	-0.50	$\text{mA}$
		$V_{\text{IN}} = 41.25 \text{ V}$ forced $V_{\text{OUT}} = 1.4 \text{ V}$			-5.00	-1.00	
Output short circuit current	$I_{\text{OS1}}$	$V_{\text{IN}} = 4.25 \text{ V}$		03	-1.8	-0.50	$\text{A}$
	$I_{\text{OS2}}$	$V_{\text{IN}} = 40 \text{ V}$			-0.50	-0.05	
Output voltage recovery after output short circuit current	$V_{\text{OUT}}$ (RECOV)	$V_{\text{IN}} = 4.25 \text{ V}$ , <u>3/</u> after $I_{\text{OS1}}$	$R_L = 2.5 \Omega$ , $C_L = 20 \mu\text{F}$	03	1.20	1.30	$\text{V}$
		$V_{\text{IN}} = 40 \text{ V}$ , <u>3/</u> after $I_{\text{OS2}}$	$R_L = 250 \Omega$		1.20	1.30	
Voltage start-up	$V_{\text{START}}$	$V_{\text{IN}} = 4.25 \text{ V}$	$R_L = 2.5 \Omega$ , $C_L = 20 \mu\text{F}$	03	1.20	1.30	$\text{V}$
Ripple rejection	$\Delta V_{\text{IN}} / \Delta V_{\text{OUT}}$	$V_{\text{IN}} = 6.25 \text{ V}$ , <u>4/</u> $e_i = 1 \text{ Vrms}$ , at $f = 2400 \text{ Hz}$	$I_L = -125 \text{ mA}$ , $T_A = 25^{\circ}\text{C}$ , see figure 11	03	65		$\text{dB}$
Output noise voltage	$V_{\text{NO}}$	$V_{\text{IN}} = 6.25 \text{ V}$ , <u>4/</u> see figure 12	$I_L = -50 \text{ mA}$ , $T_A = 25^{\circ}\text{C}$	03		120	$\mu\text{Vrms}$
Line transient response	$\Delta V_{\text{OUT}} / \Delta V_{\text{IN}}$	$V_{\text{IN}} = 6.25 \text{ V}$ , <u>5/</u> $\Delta V_{\text{IN}} = 3.0 \text{ V}$ , see figure 13	$I_L = -10 \text{ mA}$ , $T_A = 25^{\circ}\text{C}$	03		6	$\text{mV/V}$
Load transient response	$\Delta V_{\text{OUT}} / \Delta I_L$	$V_{\text{IN}} = 6.25 \text{ V}$ , <u>5/</u> see figure 14	$I_L = -50 \text{ mA}$ , $\Delta I_L = -200 \text{ mA}$ $T_A = 25^{\circ}\text{C}$	03		0.60	$\text{mV/mA}$

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions <u>1/ 2/</u> $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ see figure 9 and 3.5 unless otherwise specified		Device type	Limits		Unit
		Input voltage	Load current		Min	Max	
Output voltage	$V_{\text{OUT}}$	$V_{\text{IN}} = 4.25 \text{ V}$	$I_L = -5 \text{ mA}, -1.5 \text{ A}$	04	1.20	1.30	V
		$V_{\text{IN}} = 41.25 \text{ V}$	$I_L = -5 \text{ mA}, -200 \text{ mA}$		1.20	1.30	
		$V_{\text{IN}} = 6.25 \text{ V},$ $T_A = 150^{\circ}\text{C}$	$I_L = -5 \text{ mA}$		1.20	1.30	
Line regulation	$V_{\text{RLINE}}$	$4.25 \text{ V} \leq V_{\text{IN}} \leq 41.25 \text{ V},$ $T_A = 25^{\circ}\text{C}$	$I_L = -5 \text{ mA}$	04	-9	9	mV
		$4.25 \text{ V} \leq V_{\text{IN}} \leq 41.25 \text{ V},$ $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	$I_L = -5 \text{ mA}$		-23	23	
Load regulation	$V_{\text{RLOAD}}$	$V_{\text{IN}} = 6.25 \text{ V},$ $T_A = 25^{\circ}\text{C}$	$-1.5 \text{ A} \leq I_L \leq -5 \text{ mA}$	04	-3.5	3.5	mV
		$V_{\text{IN}} = 6.25 \text{ V},$ $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	$-1.5 \text{ A} \leq I_L \leq -5 \text{ mA}$		-12	12	
		$V_{\text{IN}} = 41.25 \text{ V},$ $T_A = 25^{\circ}\text{C}$	$-200 \text{ mA} \leq I_L \leq -5 \text{ mA}$		-3.5	3.5	
		$V_{\text{IN}} = 41.25 \text{ V},$ $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	$-200 \text{ mA} \leq I_L \leq -5 \text{ mA}$		-12	12	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions <u>1/ 2/</u> $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ see figure 9 and 3.5 unless otherwise specified		Device type	Limits		Unit
		Input voltage	Load current		Min	Max	
Thermal regulation	$V_{RTH}$	$V_{IN} = 14.6 \text{ V},$ $T_A = 25^{\circ}\text{C}$	$I_L = -1.5 \text{ A}$	04	-12	12	mV
Adjust pin current	$I_{ADJ}$	$V_{IN} = 4.25 \text{ V}$	$I_L = -5 \text{ mA}$	04	-100	-15	$\mu\text{A}$
		$V_{IN} = 41.25 \text{ V}$	$I_L = -5 \text{ mA}$		-100	-15	
Adjust pin current change versus line voltage	$\Delta I_{ADJ} (\text{LINE})$	$4.25 \text{ V} \leq V_{IN} \leq 41.25 \text{ V}$	$I_L = -5 \text{ mA}$	04	-5	5	$\mu\text{A}$
Adjust pin current change versus load current	$\Delta I_{ADJ} (\text{LOAD})$	$V_{IN} = 6.25 \text{ V}$	$-1.5 \text{ A} \leq I_L \leq -5 \text{ mA}$	04	-5	5	$\mu\text{A}$
Minimum load current	$I_Q$	$4.25 \text{ V} \leq V_{IN} \leq 14.25 \text{ V},$ forced $V_{OUT} = 1.4 \text{ V}$		04	-3.00	-0.20	$\text{mA}$
		$V_{IN} = 41.25 \text{ V}$ forced $V_{OUT} = 1.4 \text{ V}$			-5.00	-1.00	
Output short circuit current	$I_{OS1}$	$V_{IN} = 4.25 \text{ V}$		04	-3.50	-1.50	$\text{A}$
	$I_{OS2}$	$V_{IN} = 40 \text{ V}$			-1.00	-0.18	
Output voltage recovery after output short circuit current	$V_{OUT} (\text{RECOV})$	$V_{IN} = 4.25 \text{ V},$ <u>3/</u> after $I_{OS1}$	$R_L = 0.833 \Omega,$ $C_L = 20 \mu\text{F}$	04	1.20	1.30	$\text{V}$
		$V_{IN} = 40 \text{ V},$ <u>3/</u> after $I_{OS2}$	$R_L = 250 \Omega$		1.20	1.30	
Voltage start-up	$V_{START}$	$V_{IN} = 4.25 \text{ V}$	$R_L = 0.833 \Omega,$ $C_L = 20 \mu\text{F}$	04	1.20	1.30	$\text{V}$
Ripple rejection	$\Delta V_{IN} / \Delta V_{OUT}$	$V_{IN} = 6.25 \text{ V},$ <u>4/</u> $e_i = 1 \text{ Vrms},$ at $f = 2400 \text{ Hz}$	$I_L = -500 \text{ mA},$ $T_A = 25^{\circ}\text{C},$ see figure 11	04	65		$\text{dB}$

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions <u>1/ 2/</u> $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ see figure 9 and 3.5 unless otherwise specified		Device type	Limits		Unit
		Input voltage	Load current		Min	Max	
		$V_{IN} = 6.25 \text{ V}$ , <u>4/</u> see figure 12	$I_L = -100 \text{ mA}$ , $T_A = 25^{\circ}\text{C}$			120	$\mu\text{V}_{\text{rms}}$
Output noise voltage	$V_{NO}$	$V_{IN} = 6.25 \text{ V}$ , <u>5/</u> $\Delta V_{IN} = -3.0 \text{ V}$ , see figure 13	$I_L = -10 \text{ mA}$ , $T_A = 25^{\circ}\text{C}$	04		6	$\text{mV/V}$
Line transient response	$\Delta V_{OUT} / \Delta V_{IN}$	$V_{IN} = 6.25 \text{ V}$ , <u>5/</u> see figure 14	$I_L = -100 \text{ mA}$ , $\Delta I_L = -400 \text{ mA}$ $T_A = 25^{\circ}\text{C}$	04		0.30	$\text{mV/mA}$
For device type 05, see figure 10							
Output voltage	$V_{OUT}$	$V_{IN} = 4.25 \text{ V}$	$I_L = -5 \text{ mA}, -3.0 \text{ A}$	05	1.20	1.30	$\text{V}$
		$V_{IN} = 36.25 \text{ V}$	$I_L = -5 \text{ mA}, -150 \text{ mA}$		1.20	1.30	
		$V_{IN} = 6.25 \text{ V}$ , $T_A = 150^{\circ}\text{C}$	$I_L = -5 \text{ mA}$		1.20	1.30	
Line regulation	$V_{RLINE}$	$4.25 \text{ V} \leq V_{IN} \leq 36.25 \text{ V}$ , $T_A = 25^{\circ}\text{C}$	$I_L = -5 \text{ mA}$	05	-4	4	$\text{mV}$
		$4.25 \text{ V} \leq V_{IN} \leq 36.25 \text{ V}$ , $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	$I_L = -5 \text{ mA}$		-20	20	
Load regulation	$V_{RLOAD}$	$V_{IN} = 6.25 \text{ V}$ , $T_A = 25^{\circ}\text{C}$	$-3.0 \text{ A} \leq I_L \leq -5 \text{ mA}$	05	-3.5	3.5	$\text{mV}$
		$V_{IN} = 6.25 \text{ V}$ , $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	$-3.0 \text{ A} \leq I_L \leq -5 \text{ mA}$		-12	12	
		$V_{IN} = 36.25 \text{ V}$ , $T_A = 25^{\circ}\text{C}$	$-150 \text{ mA} \leq I_L \leq -5 \text{ mA}$		-3.5	3.5	
		$V_{IN} = 36.25 \text{ V}$ , $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	$-150 \text{ mA} \leq I_L \leq -5 \text{ mA}$		-12	12	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions <u>1/ 2/</u> $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ see figure 10 and 3.5 unless otherwise specified		Device type	Limits		Unit
		Input voltage	Load current		Min	Max	
Thermal regulation	$V_{RTH}$	$V_{IN} = 11.25 \text{ V},$ $T_A = 25^{\circ}\text{C}$	$I_L = -1.0 \text{ A}$	05	-5	5	mV
Adjust pin current	$I_{ADJ}$	$V_{IN} = 4.25 \text{ V}$	$I_L = -5 \text{ mA}$	05	-100	-15	$\mu\text{A}$
		$V_{IN} = 36.25 \text{ V}$	$I_L = -5 \text{ mA}$		-100	-15	
Adjust pin current change versus line voltage	$\Delta I_{ADJ} (\text{LINE})$	$4.25 \text{ V} \leq V_{IN} \leq 36.25 \text{ V}$	$I_L = -5 \text{ mA}$	05	-5	5	$\mu\text{A}$
Adjust pin current change versus load current	$\Delta I_{ADJ} (\text{LOAD})$	$V_{IN} = 6.25 \text{ V}$	$-3.0 \text{ A} \leq I_L \leq -5 \text{ mA}$	05	-5	5	$\mu\text{A}$
Minimum load current	$I_Q$	$4.25 \text{ V} \leq V_{IN} \leq 14.25 \text{ V},$ forced $V_{OUT} = 1.4 \text{ V}$		05	-3.00	-0.50	mA
		$V_{IN} = 36.25 \text{ V}$ forced $V_{OUT} = 1.4 \text{ V}$			-5.00	-0.50	
Output short circuit current	$I_{OS1}$	$V_{IN} = 4.25 \text{ V}$		05	-5.2	-3.0	A
	$I_{OS2}$	$V_{IN} = 35 \text{ V}$			-2.0	-0.15	
Output voltage recovery after output short circuit current	$V_{OUT} (\text{RECOV})$	$V_{IN} = 4.25 \text{ V},$ <u>3/</u> after $I_{OS1}$	$R_L = 0.416 \Omega,$ $C_L = 20 \mu\text{F}$	05	1.20	1.30	V
		$V_{IN} = 35 \text{ V},$ <u>3/</u> after $I_{OS2}$	$R_L = 250 \Omega$		1.20	1.30	
Voltage start-up	$V_{START}$	$V_{IN} = 4.25 \text{ V}$	$R_L = 0.416 \Omega,$ $C_L = 20 \mu\text{F}$	05	1.20	1.30	V
Ripple rejection	$\Delta V_{IN} / \Delta V_{OUT}$	$V_{IN} = 6.25 \text{ V},$ <u>4/</u> $e_i = 1 \text{ Vrms},$ at $f = 2400 \text{ Hz}$	$I_L = -500 \text{ mA},$ $T_A = 25^{\circ}\text{C},$ see figure 11	05	65		dB

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions <u>1</u> / <u>2</u> / $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ see figure 10 and 3.5 unless otherwise specified		Device type	Limits		Unit
					Min	Max	
		Input voltage	Load current				
Output noise voltage	$V_{NO}$	$V_{IN} = 6.25 \text{ V}$ , <u>4</u> / see figure 12	$I_L = -100 \text{ mA}$ , $T_A = 25^{\circ}\text{C}$	05		120	$\mu\text{V}_{\text{rms}}$
Line transient response	$\Delta V_{OUT} / \Delta V_{IN}$	$V_{IN} = 6.25 \text{ V}$ , <u>5</u> / $\Delta V_{IN} = 3.0 \text{ V}$ , see figure 13	$I_L = -10 \text{ mA}$ , $T_A = 25^{\circ}\text{C}$	05		12	$\text{mV/V}$
Load transient response	$\Delta V_{OUT} / \Delta I_L$	$V_{IN} = 6.25 \text{ V}$ , <u>5</u> / see figure 14	$I_L = -100 \text{ mA}$ , $\Delta I_L = -400 \text{ mA}$ $T_A = 25^{\circ}\text{C}$	05		0.30	$\text{mV/mA}$
Output voltage	$V_{OUT}$	$V_{IN} = 4.25 \text{ V}$	$I_L = -5 \text{ mA}, -5.0 \text{ A}$	06	1.19	1.29	V
		$V_{IN} = 36.25 \text{ V}$	$I_L = -5 \text{ mA}, -150 \text{ mA}$		1.19	1.29	
		$V_{IN} = 6.25 \text{ V}$	$I_L = -7.0 \text{ A}$		1.19	1.29	
		$V_{IN} = 6.25 \text{ V}$ , $T_A = 150^{\circ}\text{C}$	$I_L = -5 \text{ mA}$		1.19	1.29	
Line regulation	$V_{RLINE}$	$4.25 \text{ V} \leq V_{IN} \leq 36.25 \text{ V}$ , $T_A = 25^{\circ}\text{C}$	$I_L = -5 \text{ mA}$	06	-4	4	$\text{mV}$
		$4.25 \text{ V} \leq V_{IN} \leq 36.25 \text{ V}$ , $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	$I_L = -5 \text{ mA}$		-17	17	
Load regulation	$V_{RLOAD}$	$V_{IN} = 6.25 \text{ V}$ , $T_A = 25^{\circ}\text{C}$	$-5.0 \text{ A} \leq I_L \leq -5 \text{ mA}$	06	-3.8	3.8	$\text{mV}$
		$V_{IN} = 6.25 \text{ V}$ , $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	$-5.0 \text{ A} \leq I_L \leq -5 \text{ mA}$		-8	8	
		$V_{IN} = 36.25 \text{ V}$ , $T_A = 25^{\circ}\text{C}$	$-150 \text{ mA} \leq I_L \leq -5 \text{ mA}$		-3.8	3.8	
		$V_{IN} = 36.25 \text{ V}$ , $-55^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$	$-150 \text{ mA} \leq I_L \leq -5 \text{ mA}$		-8	8	

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions <u>1/2/</u> $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ see figure 10 and 3.5 unless otherwise specified		Device type	Limits		Unit
					Min	Max	
		Input voltage	Load current				
Thermal regulation	$V_{RTH}$	$V_{IN} = 11.25 \text{ V}$ , $T_A = 25^{\circ}\text{C}$	$I_L = -1.0 \text{ A}$	06	-2	2	mV
Adjust pin current	$I_{ADJ}$	$V_{IN} = 4.25 \text{ V}$	$I_L = -5 \text{ mA}$	06	-100	-15	$\mu\text{A}$
		$V_{IN} = 36.25 \text{ V}$	$I_L = -5 \text{ mA}$		-100	-15	
Adjust pin current change versus line voltage	$\Delta I_{ADJ}$ (LINE)	$4.25 \text{ V} \leq V_{IN} \leq 36.25 \text{ V}$	$I_L = -5 \text{ mA}$	06	-5	5	$\mu\text{A}$
Adjust pin current change versus load current	$\Delta I_{ADJ}$ (LOAD)	$V_{IN} = 6.25 \text{ V}$	$-5.0 \text{ A} \leq I_L \leq -5 \text{ mA}$	06	-5	5	$\mu\text{A}$
Minimum load current	$I_Q$	$4.25 \text{ V} \leq V_{IN} \leq 14.25 \text{ V}$ , forced $V_{OUT} = 1.4 \text{ V}$		06	-3.00	-0.50	mA
		$V_{IN} = 36.25 \text{ V}$ forced $V_{OUT} = 1.4 \text{ V}$			-5.00	-0.50	
Output short circuit current	$I_{OS1}$	$V_{IN} = 4.25 \text{ V}$ , $t = 0.1 \text{ ms}$		06	-16.0	-7.0	A
	$I_{OS2}$	$V_{IN} = 4.25 \text{ V}$ , $t = 0.5 \text{ ms}$			-16.0	-7.0	
	$I_{OS3}$	$V_{IN} = 4.25 \text{ V}$ , $t = 5.0 \text{ ms}$			-15.0	-5.0	
	$I_{OS4}$	$V_{IN} = 35 \text{ V}$ , $t = 10 \text{ ms}$			-3.0	-0.20	
Output voltage recovery after output short circuit current	$V_{OUT}$ (RECOV)	$V_{IN} = 4.25 \text{ V}$ , <u>3/</u> after $I_{OS3}$	$R_L = 0.25 \Omega$ , $C_L = 20 \mu\text{F}$	06	1.19	1.29	V
		$V_{IN} = 35 \text{ V}$ , <u>3/</u> after $I_{OS4}$	$R_L = 250 \Omega$		1.19	1.29	
Voltage start-up	$V_{START}$	$V_{IN} = 4.25 \text{ V}$	$R_L = 0.25 \Omega$ , $C_L = 20 \mu\text{F}$	06	1.19	1.29	V

See footnotes at end of table.

TABLE I. Electrical performance characteristics – Continued.

Test	Symbol	Conditions <u>1/ 2/</u> $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ see figure 10 and 3.5 unless otherwise specified		Device type	Limits		Unit
		Input voltage	Load current		Min	Max	
Ripple rejection	$\Delta V_{IN} / \Delta V_{OUT}$	$V_{IN} = 6.25 \text{ V}, \underline{4/}$ $e_i = 1 \text{ Vrms},$ at $f = 2400 \text{ Hz}$	$I_L = -500 \text{ mA},$ $T_A = 25^{\circ}\text{C},$ see figure 11	06	65		dB
Output noise voltage	$V_{NO}$	$V_{IN} = 6.25 \text{ V}, \underline{4/}$ see figure 12	$I_L = -100 \text{ mA},$ $T_A = 25^{\circ}\text{C}$	06		120	$\mu\text{Vrms}$
Line transient response	$\Delta V_{OUT} / \Delta V_{IN}$	$V_{IN} = 6.25 \text{ V}, \underline{5/}$ $\Delta V_{IN} = 3.0 \text{ V},$ see figure 13	$I_L = -10 \text{ mA},$ $T_A = 25^{\circ}\text{C}$	06		12	$\text{mV/V}$
Load transient response	$\Delta V_{OUT} / \Delta I_L$	$V_{IN} = 6.25 \text{ V}, \underline{5/}$ see figure 14	$I_L = -100 \text{ mA},$ $\Delta I_L = -400 \text{ mA}$ $T_A = 25^{\circ}\text{C}$	06		0.30	$\text{mV/mA}$

- 1/ All tests performed at  $T_A = 125^{\circ}\text{C}$  may at the manufacturer's option, be performed at  $T_A = 150^{\circ}\text{C}$ .  
Specifications for  $T_A = 125^{\circ}\text{C}$  shall then apply at  $T_A = 150^{\circ}\text{C}$ .
- 2/ Static tests with load currents greater than 5 mA are performed under pulsed conditions defined on figures 9 or 10 as applicable.
- 3/ Output voltage recovery test shall be performed, with the designated load conditions, immediately after removal of each  $I_{OS}$  test forced output voltage condition.
- 4/ The meter for  $e_i$  and  $e_o$  shall have a minimum bandwidth from 10 Hz to 10 kHz and shall measure true rms voltages.
- 5/ The oscilloscope shall have a bandwidth between 5 and 15 MHz.

4. VERIFICATION.

4.1 Sampling and inspection. Sampling and inspection procedures should be in accordance with MIL-PRF-38535 or as modified in the device manufacturer's Quality Management (QM) plan. The modification in the QM plan shall not effect the form, fit, or function as described herein.

4.2 Screening. Screening shall be in accordance with MIL-PRF-38535, and shall be conducted on all devices prior to qualification and quality conformance inspection. The following additional criteria shall apply:

- a. For class S and B devices, an additional burn-in screen shall be performed to test the operation of the thermal shutdown circuit. This screen shall be performed after serialization (3.1.8 of method 5004 of MIL-STD-883) and before interim electrical parameters (pre burn-in, 3.1.9 of method 5004 of MIL-STD-883). The requirements of 3.2.3 of method 1015 of MIL-STD-883 shall apply to this screen except the devices need not be tested in an oven.
- b. Interim and final electrical test parameters shall be as specified in table II, except interim electrical parameters test prior to burn-in is optional at the discretion of the manufacturer.
- c. The burn-in test duration, test condition, and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document control by the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.
- d. Reverse bias burn-in shall not be performed.
- e. Additional screening for space level product shall be as specified in MIL-PRF-38535.
- f. Constant acceleration (method 2001 of MIL-STD-883); test condition B shall be used for case Y.

4.3 Qualification inspection. Qualification inspection shall be in accordance with MIL-PRF-38535.

4.4 Technology Conformance inspection (TCI). Technology conformance inspection shall be in accordance with MIL-PRF-38535 and herein for groups A, B, C, and D inspections (see 4.4.1 through 4.4.4).

4.4.1 Group A inspection. Group A inspection shall be in accordance with table III of MIL-PRF-38535 and as follows:

- a. Tests shall be as specified in table II herein.
- b. Subgroups 5, 6, 8, 9, 10, and 11 shall be omitted.

4.4.2 Group B inspection. Group B inspection shall be in accordance with table II of MIL-PRF-38535 and as follows:

- a. When using the method 5005 option, end point electrical parameters shall be as specified in table II herein.
- b. When using the method 5005 option, constant acceleration for class S (method 2001 of MIL-STD-883); test condition B shall be used for case Y.

TABLE II. Electrical test requirements.

MIL-PRF-38535 test requirements	Subgroups (see table III)	
	Class S devices	Class B devices
Interim electrical parameters	1	1
Final electrical test parameters <u>1/</u>	1,2,3,4	1,2,3,4
Group A test requirements	1,2,3,4,7	1,2,3,4,7
Group B electrical test parameters when using the method 5005 QCI option	1,2,3, and table IV delta limits	N/A
Group C electrical parameters	1,2,3, and table IV delta limits	1 and table IV delta limits
Group D end point electrical parameters	1,2,3	1

1/ PDA applies to subgroup 1.

4.4.3 Group C inspection. Group C inspection shall be in accordance with table IV of MIL-PRF-38535 and as follows:

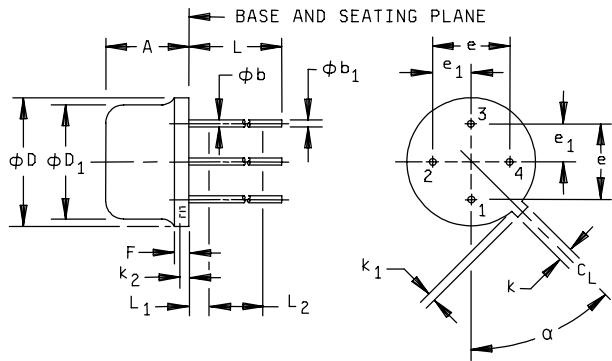
- a. End point electrical parameters shall be as specified in table II herein. Delta limits shall apply to group C inspection for classes B and S devices.
- b. The steady-state life test duration, test condition, and test temperature, or approved alternatives shall be as specified in the device manufacturer's QM plan in accordance with MIL-PRF-38535. The burn-in test circuit shall be maintained under document control by the device manufacturer's Technology Review Board (TRB) in accordance with MIL-PRF-38535 and shall be made available to the acquiring or preparing activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.

4.4.4 Group D inspection. Group D inspection shall be in accordance with table V of MIL-PRF-38535 and as follows:

- a. End point electrical parameters shall be as specified in table II herein.
- b. Constant acceleration (method 2001 of MIL-STD-883); test condition B shall be used for case Y.

4.5 Methods of inspection. Methods of inspection shall be as specified and as follows.

4.5.1 Voltage and current. All voltage values given are referenced to the designated return sense line. Currents given are conventional current and positive when flowing into the referenced terminal.

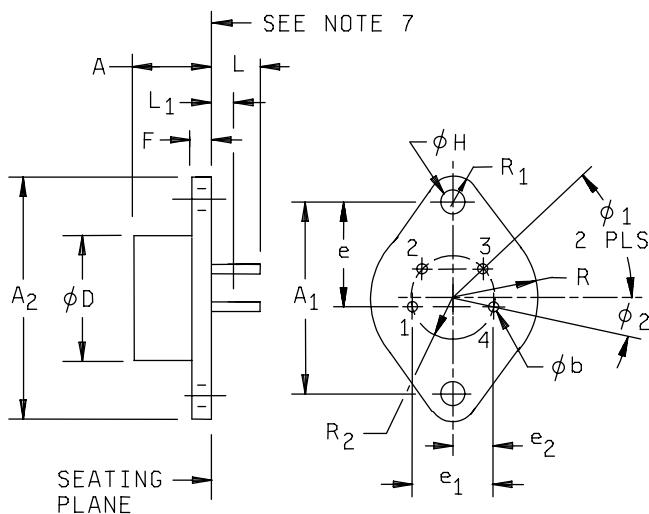


Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
A	.240	.260	6.10	6.60	
phi b	.016	.019	.41	.48	3
phi b1	.016	.021	.41	.53	3
phi D	.335	.370	8.51	9.40	
phi D1	.305	.335	7.79	8.51	
e	.200	T.P.	5.08	T.P	5
e1	.100	T.P.	2.54	T.P	5
F	---	.050	---	1.27	
k	.028	.034	.71	.86	
k1	.029	.045	.74	1.14	4
k2	.009	.041	.23	1.04	
L	.500	---	12.70	---	
L1	---	.050	---	1.27	
L2	.250	---	6.35	---	
alpha	45°	T.P	45°	T.P	5

## NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only and are based upon 1.00 inch = 25.4 mm.
3. (Four leads) phi b applies between L<sub>1</sub> and L<sub>2</sub>. phi b1 applies between L<sub>2</sub> and .500 (12.70 mm) from the reference plane.  
Diameter is uncontrolled in L<sub>1</sub> and beyond .500 (12.70 mm) from the reference plane.
4. Four leads.
5. Measured from the maximum diameter of the product.
6. Leads having a maximum diameter .019 (.48 mm) measured in gaging plane .054 (1.37 mm) + .001 (.03 mm) - .000 (.00 mm) below the base plane of the product shall be within .007 (.18 mm) of their true position relative to a maximum width tab.
7. The product may be measured by direct methods or by gage.

FIGURE 1. Case outline X (device type 01).



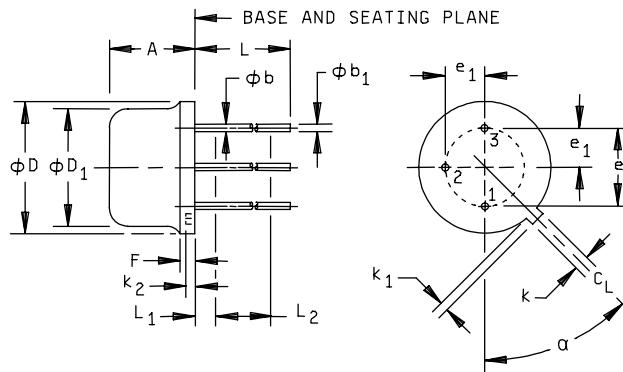
Symbol	Dimensions				Notes
	Inches		Millimeters		
	Min	Max	Min	Max	
A	.250	.450	6.35	11.43	
A <sub>1</sub>	1.177	1.197	29.90	30.40	
A <sub>2</sub>	1.480	1.500	37.59	38.10	
φb	.038	.043	.97	1.09	3,7
φD	---	.875	---	22.22	
e	.655	.675	16.64	17.14	
e <sub>1</sub>	.420	.440	10.67	11.18	
e <sub>2</sub>	.205	.225	5.21	5.72	
F	.060	.135	1.52	3.43	
φH	.151	.161	3.84	4.09	5,6
L	.312	.500	7.92	12.70	4
L <sub>1</sub>	---	.050	---	1.27	3,5
R	.495	.525	12.57	13.34	
R <sub>1</sub>	.131	.188	3.33	4.78	
R <sub>2</sub>	.470	T.P.	11.94	T.P.	
θ <sub>1</sub>	54°	T.P.	54°	T.P.	
θ <sub>2</sub>	18°	T.P.	18°	T.P.	

FIGURE 2. Case outline Y (device type 02).

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only and are based upon 1.00 inch = 25.4 mm.
3. (Four leads)  $\phi b$  applies between  $L_1$  and .500 (12.70 mm) from the seating plane.  
Diameter is uncontrolled in  $L_1$  and beyond .500 (12.70 mm) from the seating plane.
4. Four leads.
5. Two holes.
6. Two holes located at true position within diameter .010 (.25 mm).
7. Leads having a maximum diameter .043 (1.09 mm) measured in gaging plane .054 (1.37 mm) + .001 (.03 mm) - .000 (.00 mm) below the seating plane shall be located at true position within diameter .014 (.36 mm).
8. The mounting surface of the header shall be flat to convex within .003 (.08 mm) inside a .930 (23.62 mm) diameter circle on the center of the header and flat to convex within .006 (.15 mm) overall.

FIGURE 2. Case outline Y (device type 02) – Continued.

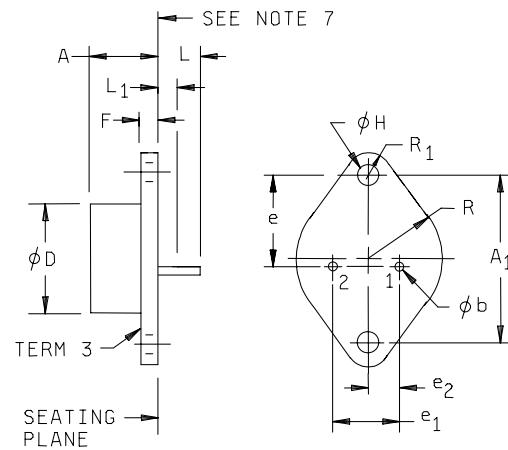


Symbol	Dimensions				Notes	
	Inches		Millimeters			
	Min	Max	Min	Max		
A	.165	.185	4.19	4.70		
phi b	.016	.019	.41	.48	3	
phi b1	.016	.021	.41	.53	3	
phi D	.335	.370	8.51	9.40		
phi D1	.305	.335	7.75	8.51		
e	.200	T.P.	5.08	T.P.	5	
e1	.100	T.P.	2.54	T.P.	5	
F	---	.050	---	1.27		
k	.028	.034	.71	.86		
k1	.029	.045	.74	1.14	4	
k2	.009	.041	.23	1.04		
L	.500	---	12.70	---		
L1	---	.050	---	1.27		
L2	.250	---	6.35	---		
alpha	45°	T.P.	45°	T.P.	5	

## NOTES:

- Dimensions are in inches.
- Metric equivalents are given for general information only and are based upon 1.00 inch = 25.4 mm.
- (Three leads)  $\phi b$  applies between  $L_1$  and  $L_2$ .  $\phi b_1$  applies between  $L_2$  and .500 (12.70 mm) from the reference plane.  
Diameter is uncontrolled in  $L_1$  and beyond .500 (12.70 mm) from the reference plane.
- Three leads.
- Measured from the maximum diameter of the product.
- Leads having a maximum diameter .019 (.48 mm) measured in gaging plane .054 (1.37 mm) + .001 (.03 mm) - .000 (.00 mm) below the base plane of the product shall be within .007 (.18 mm) of their true position relative to a maximum width tab.
- The product may be measured by direct methods or by gage.

FIGURE 3. Case outline X (device type 03).

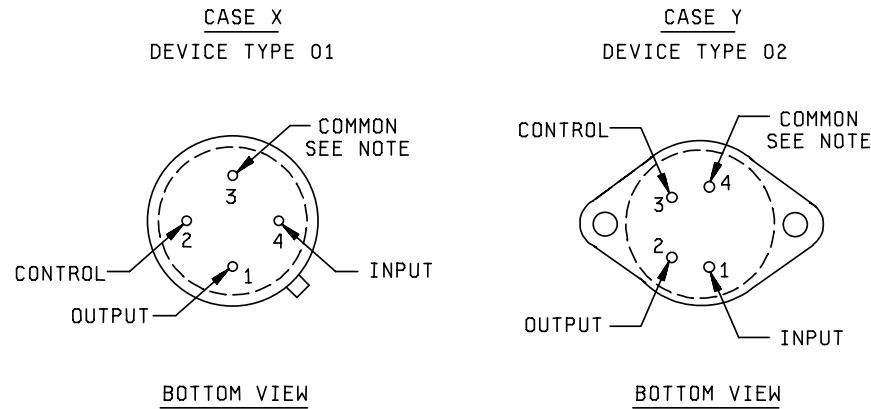
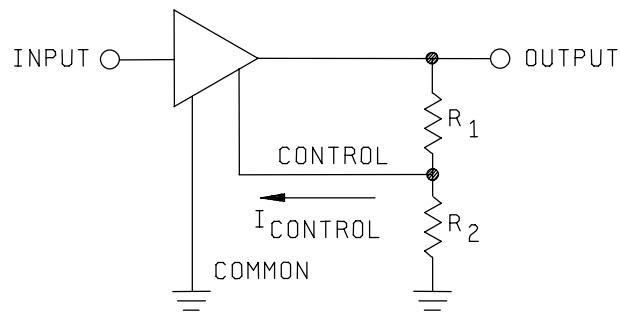


Symbol	Dimensions				Notes	
	Inches		Millimeters			
	Min	Max	Min	Max		
A	.250	.450	6.35	11.43		
A <sub>1</sub>	1.177	1.197	29.90	30.40		
ϕb	.038	.043	.97	1.09	3,7	
ϕD	---	.875	---	22.22		
e	.655	.675	16.64	17.14		
e <sub>1</sub>	.420	.440	10.67	11.18		
e <sub>2</sub>	.205	.225	5.21	5.72		
F	.060	.135	1.52	3.43		
ϕH	.151	.161	3.84	4.09	5,6	
L	.312	.500	7.92	12.70	4	
L <sub>1</sub>	---	.050	---	1.27	3,5	
R	.495	.525	12.57	13.34		
R <sub>1</sub>	.131	.188	3.33	4.78		

## NOTES:

- Dimensions are in inches.
- Metric equivalents are given for general information only and are based upon 1.00 inch = 25.4 mm.
- (Two leads) ϕb applies between L<sub>1</sub> and .500 (12.70 mm) from the seating plane.  
Diameter is uncontrolled in L<sub>1</sub> and beyond .500 (12.70 mm) from the seating plane.
- Two leads.
- Two holes.
- Two holes located at true position within diameter .010 (.25 mm).
- Leads having a maximum diameter .043 (1.09 mm) measured in gaging plane .054 (1.37 mm) + .001 (.03 mm) - .000 (.00 mm) below the seating plane shall be located at true position within diameter .014 (.36 mm).
- The mounting surface of the header shall be flat to convex within .003 (.08 mm) inside a .930 (23.62 mm) diameter circle on the center of the header and flat to convex within .006 (.15 mm) overall.

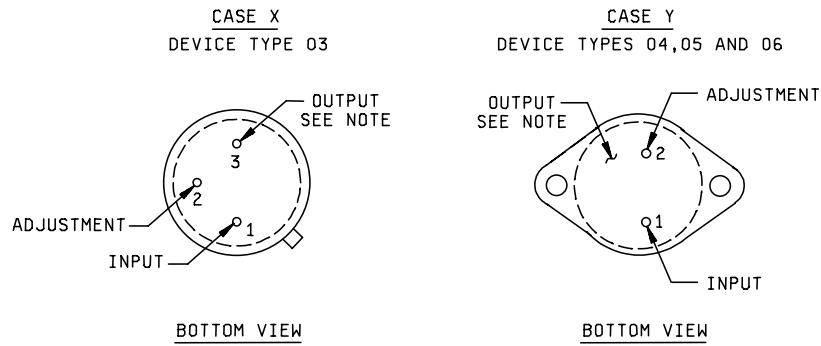
FIGURE 4. Case outline Y (device types 04, 05, and 06).

FIGURE 5. Terminal connections for device types 01 and 02.

## NOTES:

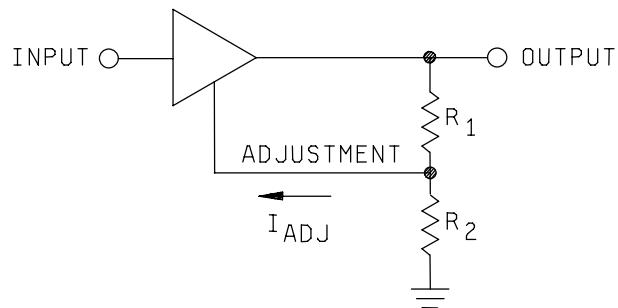
1.  $V_{OUT} = [((R_1 + R_2) / R_2) \times V_{CONTROL} + |I_{CONTROL}| \times R_1] \text{ volts.}$
2.  $V_{CONTROL} = 5.00 \text{ V (nominal).}$
3.  $R_2 = 1.0 \text{ k}\Omega$  provides a minimum of  $|5 \text{ mA}|$  load to the regulator at any  $V_{OUT}$ .

FIGURE 6. Block diagram for device types 01 and 02.



NOTE: Case is connected to output.

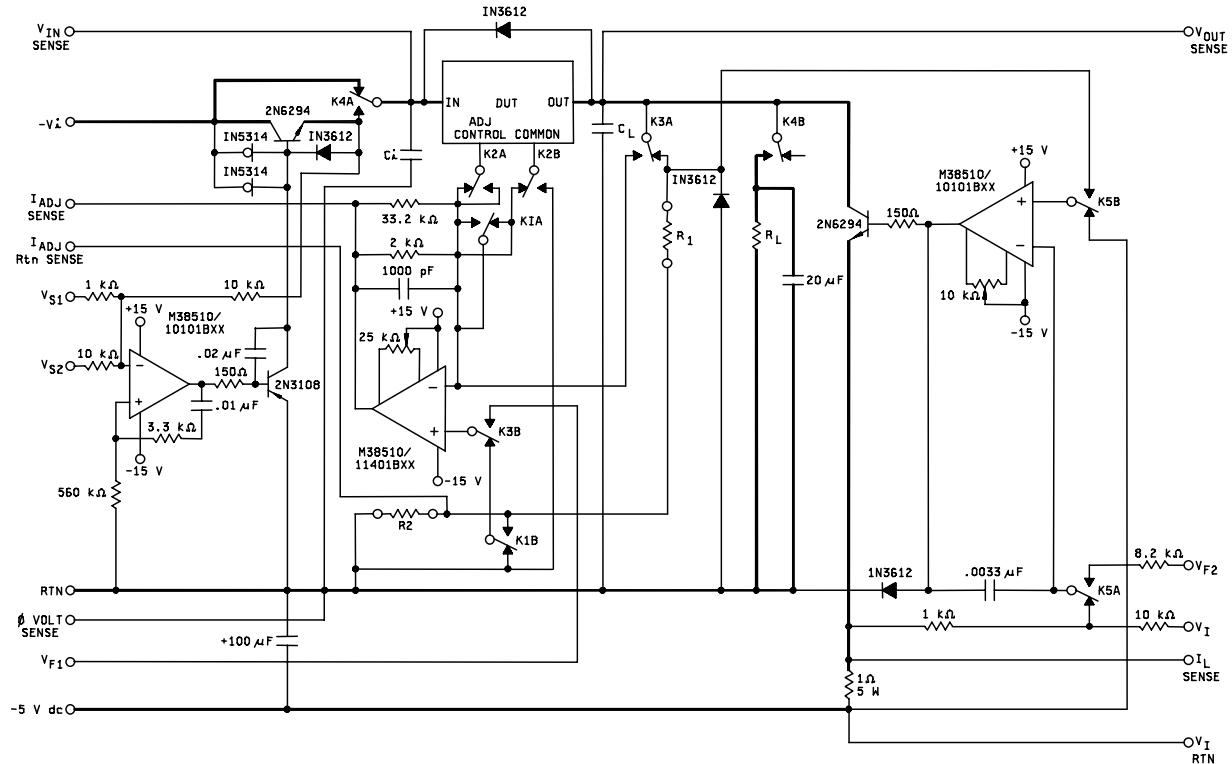
FIGURE 7. Terminal connections for 03, 04, 05, and 06.



NOTES:

1.  $V_{OUT} = [(R_1 + R_2) / R_1] \times (1.25) + |I_{ADJ}| \times R_2$  volts.
2.  $R_1 = 250 \Omega$  provides a minimum of  $|5 \text{ mA}|$  load to the regulator at any  $V_{OUT}$ .

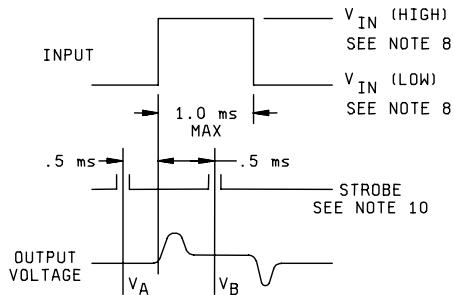
FIGURE 8. Block diagram for device types 03, 04, 05, and 06.



Device table				
Device type	01	02	03	04
R <sub>1</sub>	0 Ω	0 Ω	249 Ω	249 Ω
R <sub>2</sub>	1 kΩ	1 kΩ	0 Ω	0 Ω
R <sub>L</sub>	10 Ω	5 Ω	2.5 Ω	0.833 Ω
C <sub>i</sub>	0.33 μF	0.33 μF	1.0 μF	1.0 μF
C <sub>L</sub>	0.1 μF	0.1 μF	1.0 μF	1.0 μF

FIGURE 9. Test circuit for static tests for device types 01, 02, 03, and 04.

LINE REGULATION WAVEFORMS



LOAD REGULATION WAVEFORMS

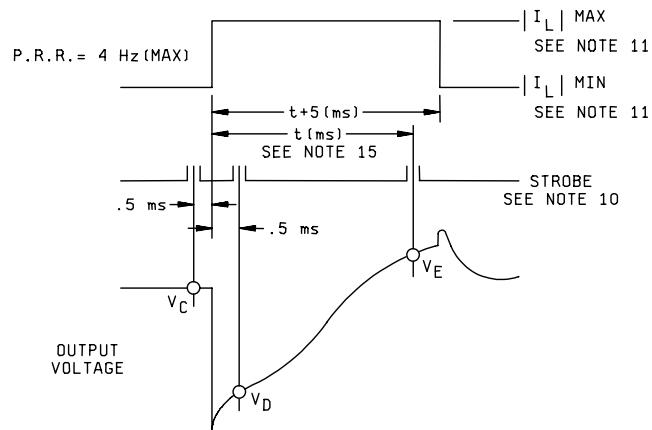


FIGURE 9. Test circuit for static tests for device types 01, 02, 03, and 04 – Continued.

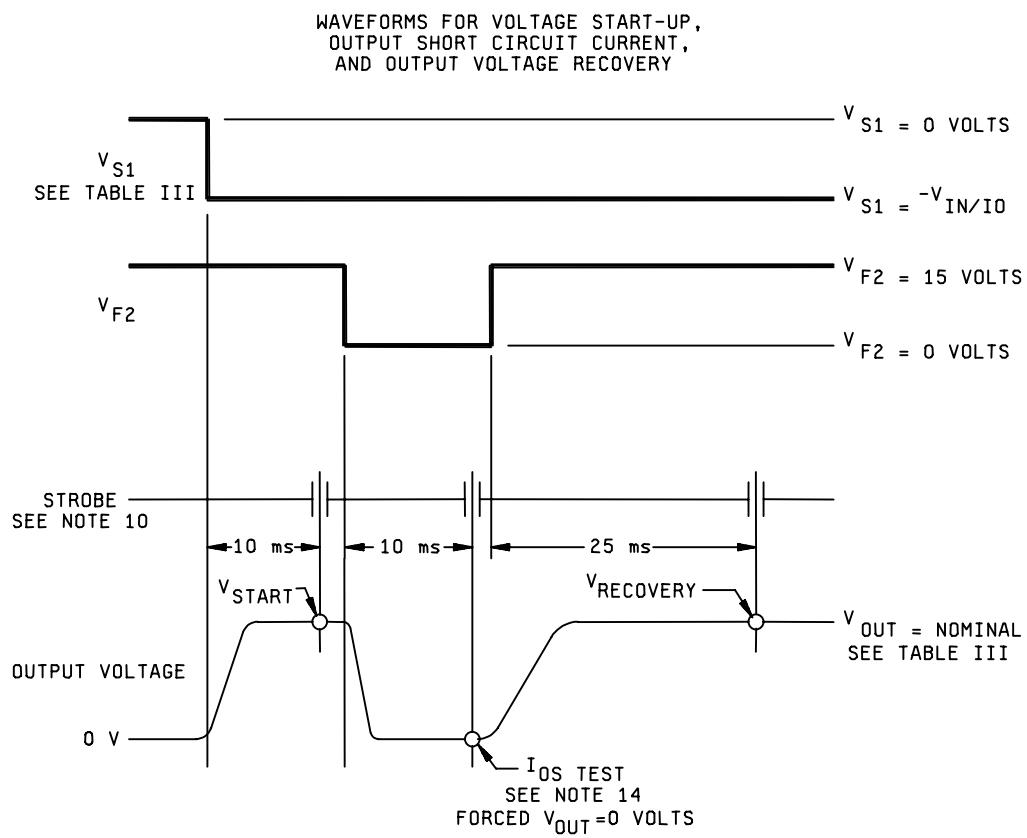
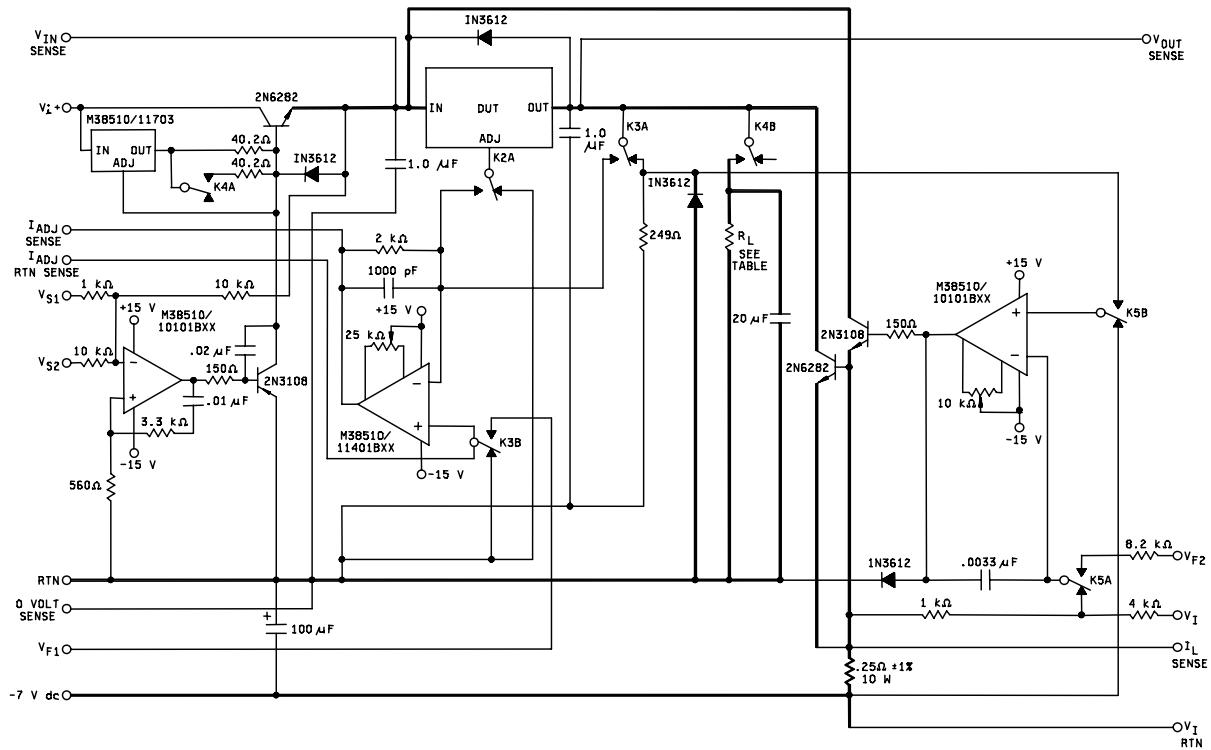


FIGURE 9. Test circuit for static tests for device types 01, 02, 03, and 04 – Continued.

## NOTES:

1. Heavy current paths ( $I \geq 0.05$  A) are indicated by bold lines.
2. Kelvins connections must be used for all output current and voltage measurements.  
For device types 03 and 04, output voltage measurements should be made at the case.  
For device type 03 only. If output voltage measurements are not made at the case but instead at the output lead, an error will result in the measurement due to internal lead resistance.  
The amount of error depends on the magnitude of the load current and the distance from the case to where the output voltage measurement is taken on the output pin.
3. The output offset voltage shall be adjusted to zero with the device under test (DUT) removed.  
The operational amplifier stabilization networks may vary with test adapter construction.  
Alternate drive circuits for the 2N6294 may be used to develop the proper load current and input voltage pulses.
4. Relay switch positions are defined in table III.
5. Load currents of 5 mA may be established via the load resistors  $R_1$  and  $R_2$ . All other load currents shall be established via the pulse load circuits. Resistors  $R_1$  and  $R_2$  shall have a tolerance  $\leq 0.1$  % for device types 01 and 02.
6. The pulse generator for the pulse load circuit shall have the following characteristics:
  - a. Pulse amplitude =  $-10 (|I_L| - V_O / (R_1 + R_2))$  volts (referenced to -5 volts).
  - b. Pulse width = 1.0 ms (unless otherwise stated).
  - c. Duty cycle = 2% (maximum).
7. Load currents shall be determined by the voltage measured across the 1 Ω resistor.  
Measurements shall be made 0.5 ms after the start of the pulse.
8.  $V_{IN}$  (LOW) and  $V_{IN}$  (HIGH) per table III herein.
9.  $V_{RLINE} = V_B - V_A$ .
10. The output voltage is sampled at specified intervals. Strobe pulse width is 100 μs maximum.
11.  $|I_L|$  (minimum) and  $|I_L|$  (maximum) per table III herein.
12.  $V_{RLOAD} = V_D - V_C$ .
13.  $V_{RTH} = V_D - V_E$ .
14.  $I_{OS} = (I_L)$  amps.
15. For device types 01 and 02,  $t = 10.5$  ms. For device types 03 and 04,  $t = 20.5$  ms.
16. For static test  $V_{RLOAD}$  1,  $I_L = 500$  mA, device type 03 only the following may apply. If output voltage measurements are taken from the output lead and not the case, the maximum limit shall be allowed to increase by 5 mV to account for the error due to internal lead resistance.

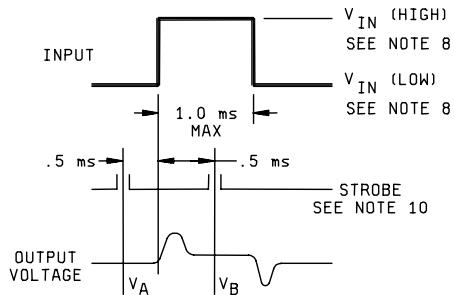
FIGURE 9. Test circuit for static tests for device types 01, 02, 03, and 04 – Continued.



Device table		
Device type	05	06
$R_L$	0.416 $\Omega$	0.25 $\Omega$

FIGURE 10. Test circuit for static tests for device types 05 and 06 .

LINE REGULATION WAVEFORMS



LOAD REGULATION WAVEFORMS

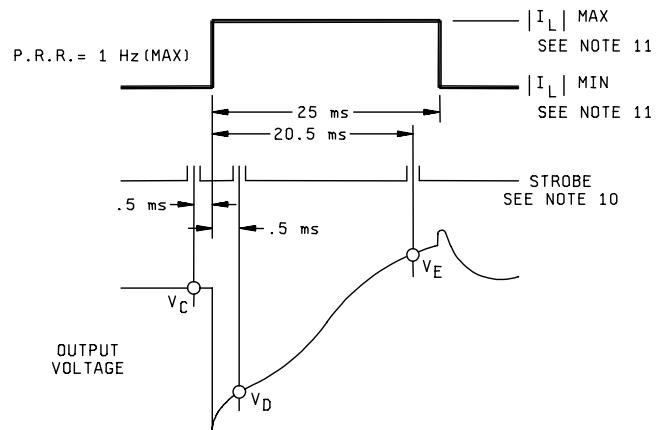
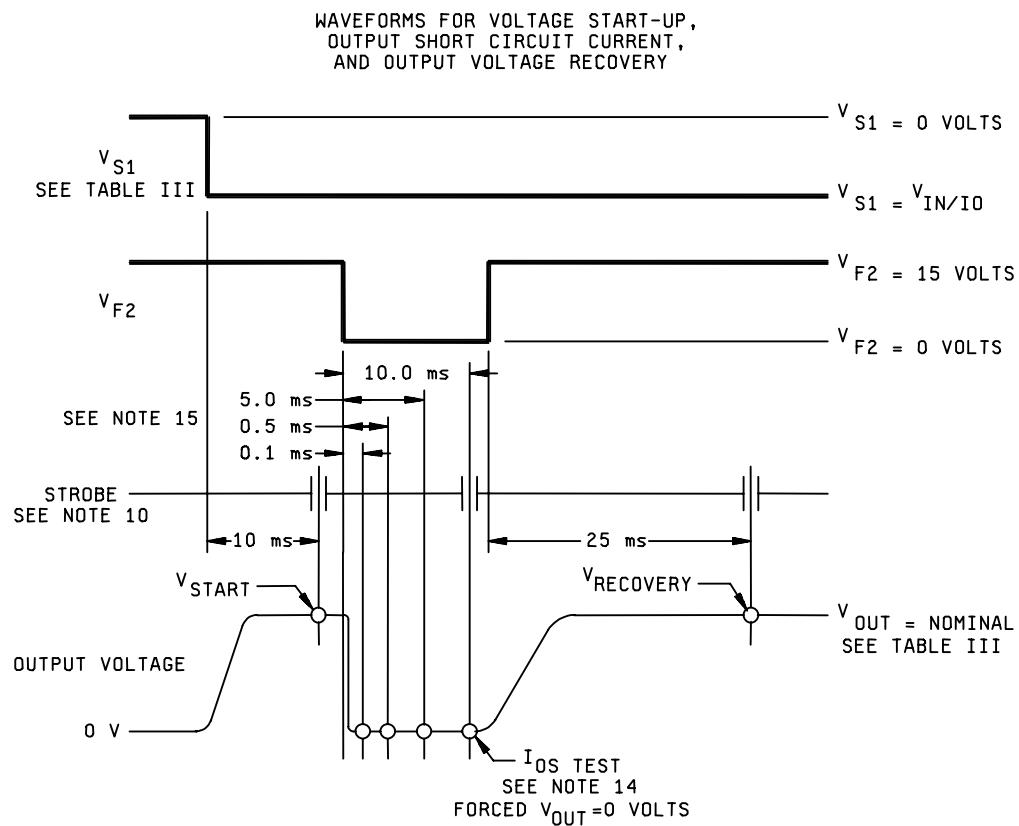


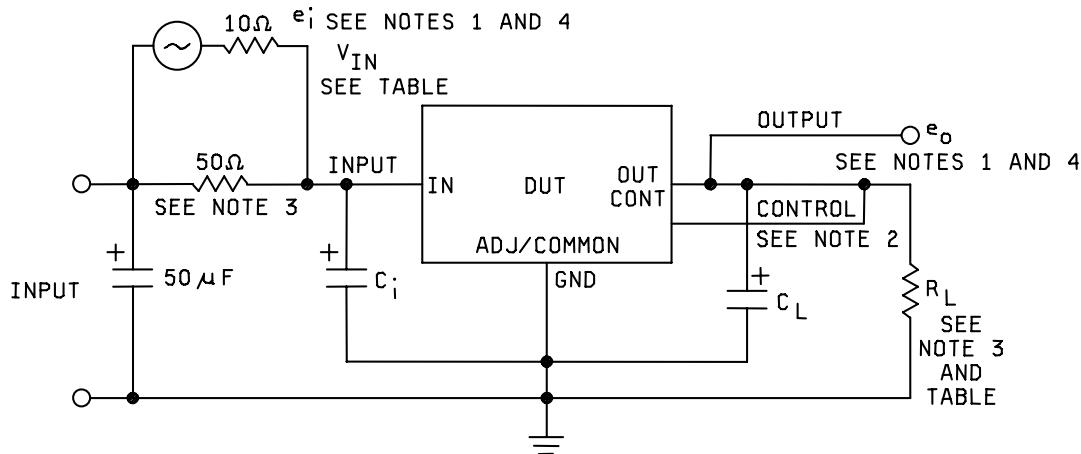
FIGURE 10. Test circuit for static tests for device types 05 and 06 - Continued.

FIGURE 10. Test circuit for static tests for device types 05 and 06 - Continued.

## NOTES:

1. Heavy current paths ( $I \geq 0.1$  A) are indicated by bold lines.
2. Kelvin connections must be used for all output current and voltage measurements.  
For device types 05 and 06, output voltage measurements shall be made at the case.
3. The output offset voltage shall be adjusted to zero with the device under test (DUT) removed.  
The operational amplifier stabilization networks may vary with test adapter construction.  
Alternate drive circuits for the 2N6282 may be used to develop the proper load current and input voltage pulses. These circuits shall require the approval of the qualifying activity.
4. Relay switch positions are defined in table III.
5. Load currents of 5 mA may be established via the  $249\ \Omega$  load resistors. All other load currents shall be established via the pulse load circuit.
6. The pulse generator for the pulse load circuit shall have the following characteristics:
  - a. Pulse amplitude =  $- (|I_L| - .005)$  volts. (referenced to  $-7$  volts)
  - b. Pulse width = 1.0 ms (unless otherwise stated).
  - c. Duty cycle = 2% (maximum).
  - d. Rise time =  $30\ \mu s$  (minimum).
7. Load currents shall be determined by the voltage measured across the  $0.25\ \Omega$  resistor.  
Measurements shall be made 0.5 ms after the start of the pulse.
8.  $V_{IN}$  (LOW) and  $V_{IN}$  (HIGH) per table III herein.
9.  $V_{RLINE} = V_B - V_A$ .
10. The output voltage is sampled at specified intervals. Strobe pulse width is  $100\ \mu s$  maximum.
11.  $|I_L|$  (minimum) and  $|I_L|$  (maximum) per table III herein.
12.  $V_{RLOAD} = V_D - V_C$ .
13.  $V_{RTH} = V_D - V_E$ .
14.  $I_{OS} = (I_L)$  amps.
15. Output short circuit current measurements at  $t = 0.1$ ,  $t = 0.5$ , and  $t = 5.0$ , are to be made on device type 06 only.

FIGURE 10. Test circuit for static tests for device types 05 and 06 – Continued.

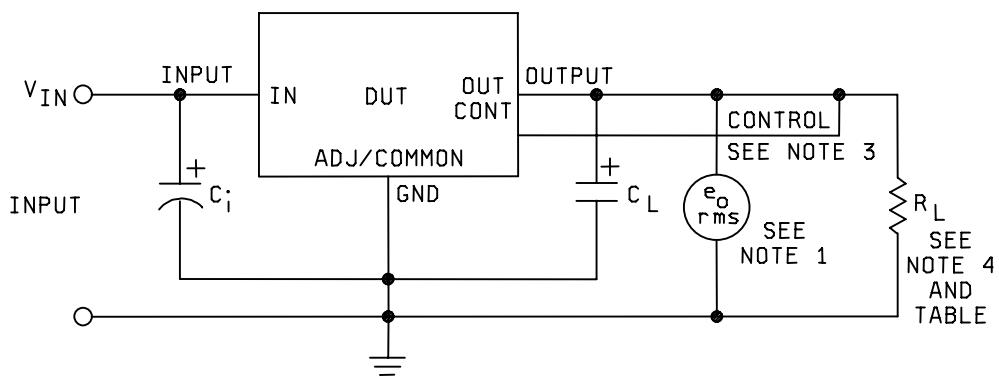


Device table						
Device types	01	02	03	04	05	06
$V_{IN}$	10 V	10 V	6.25 V	6.25 V	6.25 V	6.25 V
$R_L$	$40.2 \Omega$	$14.3 \Omega$	$10 \Omega$	$2.5 \Omega$	$2.5 \Omega$	$2.5 \Omega$
$C_i$	$0.33 \mu F$	$0.33 \mu F$	$1.0 \mu F$	$1.0 \mu F$	$1.0 \mu F$	$1.0 \mu F$
$C_L$	$0.1 \mu F$	$0.1 \mu F$	$1.0 \mu F$	$1.0 \mu F$	$1.0 \mu F$	$1.0 \mu F$

## NOTES:

1.  $e_i = 1$  Vrms at  $f = 2400$  Hz (measured at the input terminals of the DUT).  
Ripple rejection =  $20 \log (e_{irms} / e_{orms})$ .
2. The control pin connection is required for device types 01 and 02 only.
3. The input  $50 \Omega$  resistor and  $R_L$  shall be type RER 70 or equivalent.
4. The meter for  $e_i$  and  $e_o$  shall have a minimum bandwidth from 10 Hz to 10 kHz and shall measure true rms voltages.

FIGURE 11. Ripple rejection test circuit.

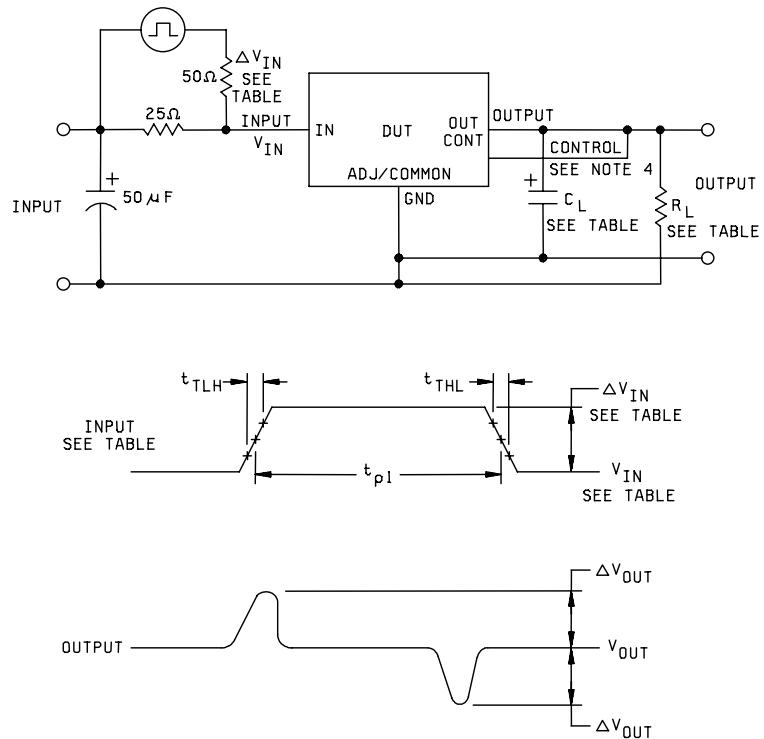


Device table						
Device type	01	02	03	04	05	06
V <sub>IN</sub>	10 V	10 V	6.25 V	6.25 V	6.25 V	6.25 V
R <sub>L</sub>	100 Ω	50 Ω	25 Ω	12.5 Ω	12.5 Ω	12.5 Ω
C <sub>i</sub>	0.33 μF	0.33 μF	1.0 μF	1.0 μF	1.0 μF	1.0 μF
C <sub>L</sub>	0.1 μF	0.1 μF	1.0 μF	1.0 μF	1.0 μF	1.0 μF

## NOTES:

1. The meter for measuring  $e_{rms}$  shall have a minimum bandwidth from 10 Hz to 10 kHz and shall measure true rms voltages.
2.  $V_{NO} = e_{rms}$
3. The control pin connection is required for device types 01 and 02 only.
4. R<sub>L</sub> shall be type RER 70 or equivalent.

FIGURE 12. Noise test circuit.

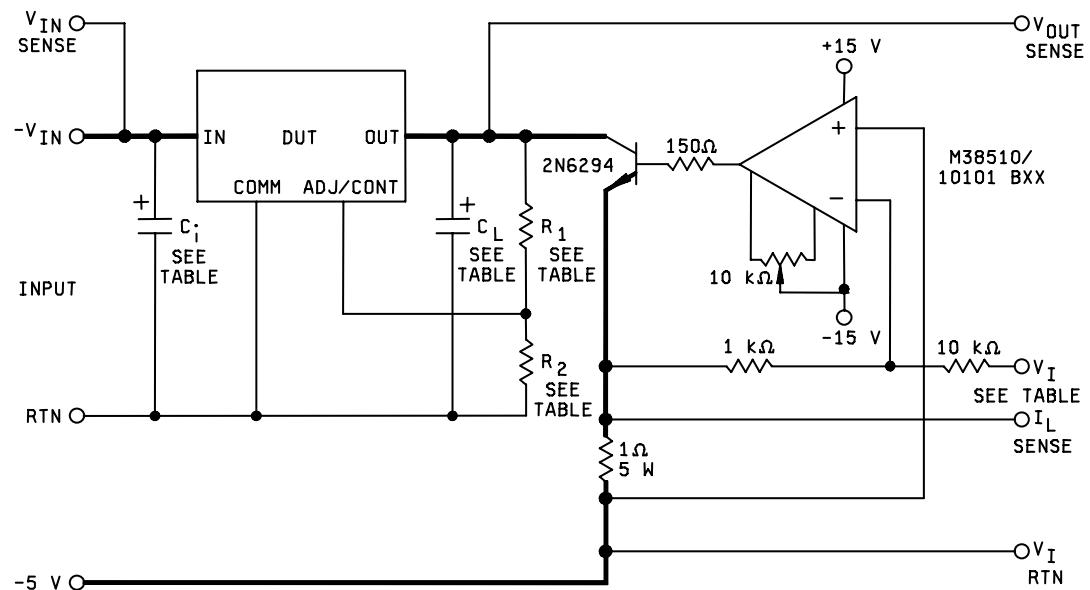


Device table						
Device type	01	02	03	04	05	06
$V_{IN}$	10 V	10 V	6.25 V	6.25 V	6.25 V	6.25 V
$\Delta V_{IN}$	3.0 V	3.0 V	3.0 V	3.0 V	3.0 V	3.0 V
$R_L$	1.25 kΩ	1.25 kΩ	120 Ω	120 Ω	120 Ω	120 Ω
$t_{THL} = t_{TLH}$	5.0 μs	5.0 μs	5.0 μs	5.0 μs	5.0 μs	5.0 μs
$C_L$	0.1 μF	0.1 μF	1.0 μF	1.0 μF	1.0 μF	1.0 μF
Notes						1

## NOTES:

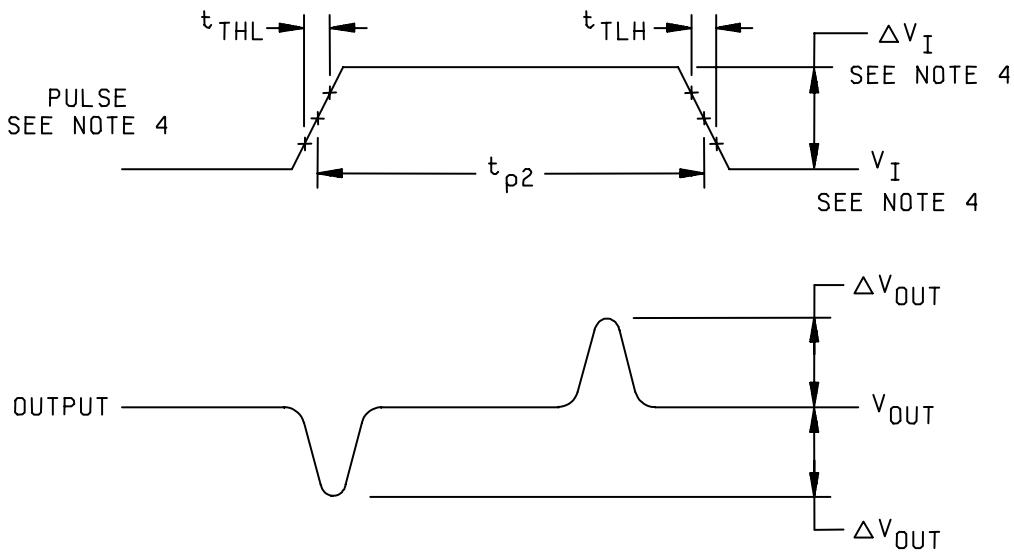
1. Measured at device input.
2. Pulse width  $t_{p1} = 25 \mu s$ ; duty cycle = 3% (maximum).
3. Oscilloscope bandwidth = 5 MHz to 15 MHz.
4. The control pin connection is required for device types 01 and 02 only.
5. The input 25 Ω resistor and  $R_L$  shall be type RER 70 or equivalent.

FIGURE 13. Line transient response test circuit.



Device table						
Device type	01	02	03	04	05	06
R <sub>1</sub>	0	0	249 Ω	249 Ω	249 Ω	249 Ω
R <sub>2</sub>	1.0 kΩ	1.0 kΩ	0	0	0	0
I <sub>L</sub>	-50 mA	-100 mA	-50 mA	-100 mA	-100 mA	-100 mA
ΔI <sub>L</sub>	-200 mA	-400 mA	-200 mA	-400 mA	-400 mA	-400 mA
V <sub>I</sub>	-0.45 V	-0.95 V	-0.45 V	-0.95 V	-0.95 V	-0.95 V
ΔV <sub>I</sub>	-2.0 V	-4.0 V	-2.0 V	-4.0 V	-4.0 V	-4.0 V
C <sub>i</sub>	0.33 μF	0.33 μF	1.0 μF	1.0 μF	1.0 μF	1.0 μF
C <sub>L</sub>	0.1 μF	0.1 μF	1.0 μF	1.0 μF	1.0 μF	1.0 μF

FIGURE 14. Load transient response test circuit.



## NOTES:

1. Heavy current paths ( $I \geq 1.0$  A) are indicated by bold lines.
2. Kelvin connections must be used for all output current and voltage measurements.
3. The operational amplifier stabilization networks may vary with test adapter construction.  
Alternate drive circuits for the 2N6294 may be used to develop the proper load current and input voltage pulses. These circuits shall require the approval of the qualifying activity.
4. The pulse generator for the pulse load circuit shall have the following characteristics.  
(See device table III.)
  - a. Voltage level ( $V_I$ ) =  $-10[|I_L| - (V_{OUT} / (R_1 + R_2))]$  volts. (Referenced to  $-5$  volts).
  - b. Pulse width ( $t_{p2}$ ) =  $25\ \mu s$ .
  - c. Duty cycle =  $3\%$  (maximum).
  - d.  $t_{THL} = t_{TLH} = 1.0\ \mu s$  for device types 01 and 02.
  - e.  $t_{THL} = t_{TLH} = 5.0\ \mu s$  for device types 03, 04, 05, and 06.
  - f. Difference voltage level ( $\Delta V_I$ ) =  $10 (I_L)$  volts.
5. a.  $\Delta V_{OUT} = 500$  mV maximum for device type 01.
- b.  $\Delta V_{OUT} = 1,000$  mV maximum for device type 02.
- c.  $\Delta V_{OUT} = 120$  mV maximum for device types 03, 04, 05, and 06.  
(These values guarantee the specified limits for load transient response.)
6. The oscilloscope shall have a bandwidth between 5 and 15 MHz.
7. Resistors  $R_1$  and  $R_2$  shall be type RER 70 or equivalent.

FIGURE 14. Load transient response test circuit – Continued.



TABLE III. Group A inspection for all device type 01 – Continued.

Subgroup	Symbol	Test no.	See figure 9 Applied test voltages (volts) (Hi – Lo pin potential)						Relays energized	Measurement sense lines	Equation	Notes	Limits	Unit				
			V <sub>N</sub> (volts)	I <sub>L</sub> (mA)	1-2 ---	4-5 ---	6-11 ---	7-2 ---	8-2 ---									
$T_A = +125^{\circ}\text{C}$	$\Delta I_{SCD}$ (LINE)	35	8	-5	8	---	---	---	---	None	12-13	E <sub>33</sub>	V	$\Delta I_{SCD} = E_{33} - E_{32} / 2000$ (LINE)	-1.0	1.0	mA	
	$\Delta I_{SCD}$ (LOAD)	36	10	-500	10	-4.95	---	---	---	"	12-13	E <sub>34</sub>	"	$\Delta I_{SCD} = E_{31} - E_{34} / 2000$ (LOAD)	-0.5	0.5	"	
	I <sub>o51</sub>	37	10	---	15	---	---	---	-1.0	0	K4,K5	10-5	E <sub>35</sub>	"	I <sub>o51</sub> = E <sub>35</sub> V <sub>OUT5</sub> = E <sub>36</sub>	-2.00	-0.50	A
	V <sub>OUT5</sub> (RECOV)	38	10	---	15	---	---	---	-1.0	15	K4,K5	9-11	E <sub>36</sub>	"	I <sub>o52</sub> = E <sub>37</sub> V <sub>OUT5</sub> = E <sub>38</sub>	4.75	5.25	V
	I <sub>o52</sub>	39	30	---	30	---	---	0	0	K5	10-5	E <sub>37</sub>	"	I <sub>o52</sub> = E <sub>37</sub> V <sub>OUT6</sub> = E <sub>38</sub>	-1.00	-0.01	A	
	V <sub>OUT6</sub> (RECOV)	40	30	---	30	---	---	15	15	K5	9-11	E <sub>38</sub>	"	I <sub>o52</sub> = E <sub>37</sub> V <sub>OUT6</sub> = E <sub>38</sub>	4.75	5.25	V	
	I <sub>CTL</sub>	41	10	-350	10	-3.45	---	---	---	K1,K2	12-13	E <sub>39</sub>	"	I <sub>CTL</sub> = E <sub>39</sub> / 33200	-8.00	-0.01	$\mu\text{A}$	
$T_A = +150^{\circ}\text{C}$	V <sub>START</sub>	42	8	-500	15	---	---	-0.8	---	K4	9-11	E <sub>40</sub>	"	See figure 9 V <sub>OUT</sub> = E <sub>40</sub>	4.75	5.25	V	
	V <sub>OUT7</sub>	43	38	-500	38	-4.95	---	---	---	None	"	E <sub>41</sub>	"	V <sub>OUT7</sub> = E <sub>41</sub>	R1 = 4.99 k $\Omega$ $\pm 0.1\%$	28.5	31.5	V
	V <sub>OUT8</sub>	44	10	-5	10	---	---	---	---	"	E <sub>42</sub>	"	V <sub>OUT8</sub> = E <sub>42</sub>	4.70	5.30	"		
	V <sub>OUT1</sub>	45	8	-5	8	---	---	---	---	None	9-11	E <sub>43</sub>	V	V <sub>OUT1</sub> = E <sub>43</sub>	4.75	5.25	V	
$T_A = -55^{\circ}\text{C}$	V <sub>OUT2</sub>	46	8	-500	8	-4.95	---	---	---	"	E <sub>44</sub>	"	V <sub>OUT2</sub> = E <sub>44</sub>	"	"	"	"	"
	V <sub>OUT3</sub>	47	30	-5	30	---	---	---	---	"	E <sub>45</sub>	"	V <sub>OUT3</sub> = E <sub>45</sub>	"	"	"	"	"
	V <sub>OUT4</sub>	48	30	-50	30	-0.45	---	---	---	"	E <sub>46</sub>	"	V <sub>OUT4</sub> = E <sub>46</sub>	"	"	"	"	"
	V <sub>RLINE1</sub>	49	8	-50	8	-0.45	---	---	---	"	E <sub>47</sub>	"	V <sub>RLINE1</sub> = E <sub>47</sub> – E <sub>46</sub>	See figure 9	-150	150	mV	
	V <sub>RLINE2</sub>	50	8	-350	8	-3.45	---	---	---	"	E <sub>48</sub>	"	V <sub>RLINE2</sub> = E <sub>48</sub> – E <sub>49</sub>	See figure 9	---	---	"	
	V <sub>RLINE2</sub>	51	25	-350	25	-3.45	---	---	---	"	E <sub>49</sub>	"	V <sub>RLOAD1</sub> = E <sub>50</sub> – E <sub>51</sub>	See figure 9	-100	100	"	
	V <sub>RLOAD1</sub>	52	10	-5	10	---	---	---	---	"	E <sub>50</sub>	"	V <sub>RLOAD2</sub> = E <sub>45</sub> – E <sub>46</sub>	See figure 9	-150	150	"	
$T_A = -55^{\circ}\text{C}$	V <sub>RLOAD1</sub>	53	10	-500	10	-4.95	---	---	---	"	E <sub>51</sub>	"	V <sub>RLOAD1</sub> = E <sub>50</sub> – E <sub>51</sub>	-8.0	-0.5	$\mu\text{A}$		
	V <sub>RLOAD2</sub>	54	---	---	---	---	---	---	---	"	---	"	V <sub>RLOAD2</sub> = E <sub>45</sub> – E <sub>46</sub>	-7.0	-0.5	"		
	I <sub>SCD1</sub>	55	10	-5	10	---	---	---	---	---	12-13	E <sub>52</sub>	"	I <sub>SCD1</sub> = E <sub>52</sub> / 2000	4.75	5.25	V	
	I <sub>SCD2</sub>	56	30	-5	30	---	---	---	---	"	E <sub>53</sub>	"	I <sub>SCD2</sub> = E <sub>53</sub> / 2000	-8.0	-0.5	"		
	$\Delta I_{SCD}$ (LINE)	57	8	-5	8	---	---	---	---	None	12-13	E <sub>54</sub>	V	$\Delta I_{SCD} = E_{54} - E_{53} / 2000$ (LINE)	-1.0	1.0	mA	
	$\Delta I_{SCD}$ (LOAD)	58	10	-500	10	-4.95	---	---	---	"	E <sub>55</sub>	"	$\Delta I_{SCD} = E_{52} - E_{55} / 2000$ (LOAD)	-0.5	0.5	"		
	I <sub>o51</sub>	59	10	---	15	---	---	-1.0	0	K4,K5	10-5	E <sub>56</sub>	"	I <sub>o51</sub> = E <sub>56</sub> V <sub>OUT5</sub> = E <sub>57</sub>	-2.00	-0.50	A	
$T_A = -55^{\circ}\text{C}$	V <sub>OUT5</sub> (RECOV)	60	10	---	15	---	---	-1.0	15	K4,K5	9-11	E <sub>57</sub>	"	I <sub>o52</sub> = E <sub>58</sub> V <sub>OUT6</sub> = E <sub>59</sub>	4.75	5.25	V	
	I <sub>o52</sub>	61	30	---	30	---	---	0	0	K5	10-5	E <sub>58</sub>	"	I <sub>o52</sub> = E <sub>58</sub> V <sub>OUT6</sub> = E <sub>59</sub>	-1.00	-0.01	A	
	V <sub>OUT6</sub> (RECOV)	62	30	---	30	---	---	15	15	K5	9-11	E <sub>59</sub>	"	I <sub>o52</sub> = E <sub>58</sub> V <sub>OUT6</sub> = E <sub>59</sub>	4.75	5.25	V	
	I <sub>CTL</sub>	63	10	-350	10	-3.45	---	---	---	K1,K2	12-13	E <sub>60</sub>	"	I <sub>CTL</sub> = E <sub>60</sub> / 33200	-8.00	-0.01	$\mu\text{A}$	
$T_A = -55^{\circ}\text{C}$	V <sub>START</sub>	64	8	-500	15	---	---	-0.8	---	K4	9-11	E <sub>61</sub>	"	See figure 9 V <sub>OUT7</sub> = E <sub>61</sub>	4.75	5.25	V	
	V <sub>OUT7</sub>	65	38	-500	38	-4.95	---	---	---	None	"	E <sub>62</sub>	"	V <sub>OUT7</sub> = E <sub>62</sub>	R1 = 4.99 k $\Omega$ $\pm 0.1\%$	28.5	31.5	V

TABLE III. Group A inspection for all device type 01 – Continued.

Subgroup	Symbol	Test no.	Test conditions	Measurement sense lines			Equation	Notes	Limits	Unit
				Symbol	Value	Units				
4	$\Delta V_{IN} / \Delta V_{OUT}$	66	Input voltage $V_{IN} = 10 \text{ V}$ $e_i = 1.0 \text{ Vrms}$ at 2400 Hz	$I_L = -125 \text{ mA}$	$E_{63}$	Vrms	$\Delta V_{IN} / \Delta V_{OUT} = -20 \log E_{63}$	See figure 11	45	---
$T_A = +25^\circ\text{C}$										dB
7	$V_{NO}$	67	$V_{IN} = 10 \text{ V}$	$I_L = -50 \text{ mA}$	$E_{64}$	Vrms	$V_{NO} = E_{64}$	See figure 12	---	$\mu\text{Vrms}$
$T_A = +25^\circ\text{C}$	$\Delta V_{OUT} / \Delta V_{IN}$	68	$V_{IN} = 10 \text{ V}$ $\Delta V_{IN} = 3.0 \text{ V}$	$I_L = -5 \text{ mA}$	$E_{65}$	V	$\Delta V_{OUT} / \Delta V_{IN} = E_{65} / 3$	See figure 13	---	mV/V
	$\Delta V_{OUT} / \Delta I_L$	69	$V_{IN} = 10 \text{ V}$	$I_L = -50 \text{ mA}$ $\Delta I_L = -200 \text{ mA}$	$E_{66}$	V	$\Delta V_{OUT} / \Delta I_L = E_{66} / 200$	See figure 14	---	2.5 mV/mA



TABLE III. Group A inspection for all device type 02 – Continued.

Subgroup	Symbol	Test no.	See figure 9								Equation				Notes		Limits		Unit
			$V_{IN}$ (volts)	$I_L$ (mA)	1-2	4-5	6-11	7-2	8-2	Relays energized	Measurement sense lines				Min	Max			
$T_A = +125^\circ C$	$\Delta I_{SCD}$ (LINE)	35	8	-5	8	---	---	---	---	None	12-13	$E_{33}$	$V$	$\Delta I_{SCD} = E_{33} - E_{32} / 2000$ (LINE)	-1.0	1.0	mA		
	$\Delta I_{SCD}$ (LOAD)	36	10	-1000	10	-9.95	---	---	---	"	"	$E_{34}$	"	$\Delta I_{SCD} = E_{31} - E_{34} / 2000$ (LOAD)	-0.5	0.5	"		
	$I_{o51}$	37	10	---	15	---	---	1.0	0	K4,K5	10-5	$E_{35}$	"	$I_{o51} = E_{35}$ $V_{OUT5} = E_{36}$	-4.00	-1.00	A		
	$V_{OUT5}$ (RECOV)	38	10	---	15	---	---	1.0	15	K4,K5	9-11	$E_{36}$	"	$V_{OUT5} = E_{36}$	4.75	5.25	V		
	$I_{o52}$	39	30	---	30	---	---	-0	0	K5	10-5	$E_{37}$	"	$I_{o52} = E_{37}$ $V_{OUT6} = E_{38}$	-2.00	-0.02	A		
	$V_{OUT6}$ (RECOV)	40	30	---	30	---	---	-0	15	K5	9-11	$E_{38}$	"	$V_{OUT6} = E_{38}$	4.75	5.25	V		
	$I_{CTL}$	41	10	-500	10	-4.95	---	---	---	K1,K2	12-13	$E_{39}$	"	$I_{CTL} = E_{39} / 33200$	-8.00	-0.01	$\mu A$		
$T_A = +150^\circ C$	$V_{START}$	42	8	-1000	15	---	---	-0.8	---	K4	9-11	$E_{40}$	"	$V_{OUT} = E_{40}$	See figure 9 waveforms	4.75	5.25	V	
	$V_{OUT7}$	43	38	-1000	38	---	---	---	---	None	"	$E_{41}$	"	$V_{OUT7} = E_{41}$ $R1 = 4.99 k\Omega \pm 0.1\%$	28.5	31.5	V		
	$V_{OUT8}$	44	10	-5	10	---	---	---	---	"	"	$E_{42}$	"	$V_{OUT8} = E_{42}$	4.70	5.30	"		
	$V_{OUT1}$	45	8	-5	8	---	---	---	---	None	9-11	$E_{43}$	$V$	$V_{OUT1} = E_{43}$	4.75	5.25	V		
	$V_{OUT2}$	46	8	-1000	8	-9.95	---	---	---	"	"	$E_{44}$	"	$V_{OUT2} = E_{44}$	"	"	"		
	$V_{OUT3}$	47	30	-5	30	---	---	---	---	"	"	$E_{45}$	"	$V_{OUT3} = E_{45}$	"	"	"		
	$V_{OUT4}$	48	30	-100	30	-0.95	---	---	---	"	"	$E_{46}$	"	$V_{OUT4} = E_{46}$	"	"	"		
$T_A = -55^\circ C$	$VR_{LINE1}$	49	8	-100	8	-0.95	---	---	---	"	"	$E_{47}$	"	$VR_{LINE1} = E_{47} - E_{46}$	See figure 9	-150	150	mV	
	$VR_{LINE2}$	50	8	-500	8	-4.95	---	---	---	"	"	$E_{48}$	"	$VR_{LINE2} = E_{48} - E_{49}$	---	---	"		
	$VR_{LINE2}$	51	25	-500	25	-4.95	---	---	---	"	"	$E_{49}$	"	$VR_{LOAD1} = E_{50} - E_{51}$	-50	50	"		
	$VR_{LOAD1}$	52	10	-5	10	---	---	---	---	"	"	$E_{50}$	"	$VR_{LOAD2} = E_{45} - E_{46}$	---	---	"		
	$VR_{LOAD1}$	53	10	-1000	10	-9.95	---	---	---	"	"	$E_{51}$	"	$VR_{LOAD1} = E_{50} - E_{51}$	-150	150	"		
	$VR_{LOAD2}$	54	---	---	---	---	---	---	---	"	"	$E_{52}$	"	$ISCD1 = E_{52} / 2000$	-7.0	-0.5	mA		
	$ISCD1$	55	10	-5	10	---	---	---	---	"	"	$E_{53}$	"	$ISCD2 = E_{53} / 2000$	-8.0	-0.5	"		
$T_A = -55^\circ C$	$\Delta I_{SCD}$ (LINE)	56	30	-5	30	---	---	---	---	None	12-13	$E_{54}$	$V$	$\Delta I_{SCD} = E_{54} - E_{53} / 2000$ (LINE)	-1.0	1.0	mA		
	$\Delta I_{SCD}$ (LOAD)	58	10	-1000	10	-9.95	---	---	---	"	"	$E_{55}$	"	$\Delta I_{SCD} = E_{52} - E_{55} / 2000$ (LOAD)	-0.5	0.5	"		
	$I_{o51}$	59	10	---	15	---	---	-1.0	0	K4,K5	10-5	$E_{56}$	"	$I_{o51} = E_{56}$ $V_{OUT5} = E_{57}$	-4.00	-1.00	A		
	$V_{OUT5}$ (RECOV)	60	10	---	15	---	---	-1.0	15	K4,K5	9-11	$E_{57}$	"	$V_{OUT5} = E_{57}$	4.75	5.25	V		
	$I_{o52}$	61	30	---	30	---	---	0	0	K5	10-5	$E_{58}$	"	$I_{o52} = E_{58}$ $V_{OUT6} = E_{59}$	-2.00	-0.02	A		
	$V_{OUT6}$ (RECOV)	62	30	---	30	---	---	15	15	K5	9-11	$E_{59}$	"	$V_{OUT6} = E_{59}$	4.75	5.25	V		
	$I_{CTL}$	63	10	-500	10	-4.95	---	---	---	K1,K2	12-13	$E_{60}$	"	$I_{CTL} = E_{60} / 33200$	-8.00	-0.01	$\mu A$		
$T_A = -55^\circ C$	$V_{START}$	64	8	-1000	15	---	---	-0.8	---	K4	9-11	$E_{61}$	"	$V_{OUT} = E_{61}$	See figure 9 waveforms	4.75	5.25	V	
	$V_{OUT7}$	65	38	-1000	38	---	---	---	---	None	"	$E_{62}$	"	$V_{OUT7} = E_{62}$	$R1 = 4.99 k\Omega \pm 0.1\%$	28.5	31.5	V	

TABLE III. Group A inspection for all device type 02 – Continued.

Subgroup	Symbol	Test no.	Test conditions	Measurement sense lines			Equation	Notes	Limits	Unit
				Symbol	Value	Units				
4	$\Delta V_{IN} / \Delta V_{OUT}$	66	Input voltage $V_{IN} = 10 \text{ V}$ $e_i = 1.0 \text{ Vrms}$ at 2400 Hz	$I_L = -350 \text{ mA}$	$e_{0ms}$	$E_{63}$	$V_{rms}$	$\Delta V_{IN} / \Delta V_{OUT} = 20 \log E_{63}$ See figure 11	45	---
$T_A = +25^\circ\text{C}$		67	$V_{NO} = 10 \text{ V}$	$I_L = -100 \text{ mA}$	$e_{0ms}$	$E_{64}$	$V_{rms}$	$V_{NO} = E_{64}$ See figure 12	---	250 $\mu\text{Vrms}$
7	$V_{NO} / \Delta V_{OUT}$	68	$V_{IN} = 10 \text{ V}$ $\Delta V_{IN} = 3.0 \text{ V}$	$I_L = -5 \text{ mA}$	$V_{OUT}$	$E_{65}$	$V$	$\Delta V_{OUT} / \Delta V_{IN} = E_{65} / 3$ See figure 13	---	30 mV/V
$T_A = +25^\circ\text{C}$	$\Delta V_{IN} / \Delta V_{OUT} / \Delta I_L$	69	$V_{IN} = 10 \text{ V}$	$I_L = -100 \text{ mA}$ $\Delta I_L = -400 \text{ mA}$	$V_{OUT}$	$E_{66}$	$V$	$\Delta V_{OUT} / \Delta I_L = E_{66} / 400$ See figure 14	---	2.5 mV/mA

TABLE III. Group A inspection for all device type 03.

Subgroup	Symbol	Test no.	Test conditions	See figure 9		Relays energized	Measurement sense lines		Equation		Notes	Lines	Unit		
				V <sub>IN</sub> (volts)	I <sub>L</sub> (mA)		Pins	Value	Units	Min	Max				
$T_A = +25^\circ C$	V <sub>OUT1</sub>	1	4.25	-5	4.25	0	---	---	---	E <sub>1</sub>	V	V <sub>OUT1</sub> = E <sub>1</sub>	1.20	1.30 V	
	V <sub>OUT2</sub>	2	4.25	-500	4.25	-4.95	---	---	---	E <sub>2</sub>	u	V <sub>OUT2</sub> = E <sub>2</sub>	u	u u	
	V <sub>OUT3</sub>	3	41.25	-5	41.25	0	---	---	---	E <sub>3</sub>	u	V <sub>OUT3</sub> = E <sub>3</sub>	u	u u	
	V <sub>OUT4</sub>	4	41.25	-50	41.25	-0.45	---	---	---	E <sub>4</sub>	u	V <sub>OUT4</sub> = E <sub>4</sub>	u	u u	
	V <sub>RLINE</sub>	5	---	---	---	---	---	---	---	---	---	V <sub>RLINE</sub> = E <sub>1</sub> - E <sub>3</sub>	See figure 9 waveforms	9 mV	
	VRLOAD1	6	6.25	-5	6.25	0	---	---	---	E <sub>5</sub>	u	V <sub>LOAD1</sub> = E <sub>5</sub> - E <sub>6</sub>	See figure 9 waveforms	u u	
	VRLOAD1	7	6.25	-500	6.25	-4.95	---	---	---	E <sub>6</sub>	u	V <sub>LOAD2</sub> = E <sub>3</sub> - E <sub>4</sub>	figure 9 waveforms	u u	
	VRLOAD2	8	---	---	---	---	---	---	---	---	---	VRTH = E <sub>7</sub>	See figure 9 waveforms t = 20.5 ms	12 u	
	VRTH	9	14.6	-500	14.6	-7.45	---	---	---	E <sub>7</sub>	u	VRTH = E <sub>7</sub>	See figure 9 waveforms	12 u	
$T_A = +125^\circ C$	I <sub>ADJ</sub>	10	4.25	-5	4.25	0	---	---	---	K2	12-13	E <sub>8</sub>	mV	-100 $\mu$ A	
	I <sub>ADJ</sub>	11	41.25	-5	41.25	0	---	---	---	E <sub>9</sub>	u	I <sub>ADJ</sub> = E <sub>9</sub> / 2000	-100	-15 $\mu$ A	
	$\Delta I_{ADJ}$	12	---	---	---	---	---	---	---	---	---	$\Delta I_{ADJ}$ = (E <sub>8</sub> - E <sub>9</sub> ) / 2000 (LINE)	-5	5 u	
	$\Delta I_{ADU}$	13	6.25	-5	6.25	0	---	---	---	E <sub>10</sub>	u	$\Delta I_{ADU}$ = (E <sub>10</sub> - E <sub>11</sub> ) / 2000 (LOAD)	-5	5 u	
	$\Delta I_{ADU}$	14	6.25	-500	6.25	-4.95	---	---	---	E <sub>11</sub>	u	$\Delta I_{ADU}$ = (E <sub>10</sub> - E <sub>11</sub> ) / 2000 (LOAD)	-5	5 u	
	I <sub>OS1</sub>	15	4.25	---	10	---	---	-0.425	0	K4,K5	10-5	E <sub>12</sub>	V	See figure 9 waveforms	1.8 u
$T_A = +125^\circ C$	V <sub>OUT5</sub>	16	4.25	---	10	---	---	-0.425	15	K4,K5	9-11	E <sub>13</sub>	V <sub>OUT5</sub> = E <sub>13</sub> (RECOV)	1.20	1.30 V
	I <sub>OS2</sub>	17	40	---	40	---	---	---	0	K5	10-5	E <sub>14</sub>	I <sub>OS2</sub> = E <sub>14</sub>	-0.5	-0.05 A
	V <sub>OUT6</sub>	18	40	---	40	---	---	---	15	K5	9-11	E <sub>15</sub>	V <sub>OUT6</sub> = E <sub>15</sub> (RECOV)	1.20	1.30 V
	I <sub>Q1</sub>	19	4.25	---	4.25	0	1.4	---	---	K3	12-13	E <sub>16</sub>	u	See figure 9 waveforms	-3.0 mA
	I <sub>Q2</sub>	20	14.25	---	14.25	0	1.4	---	---	K3	12-13	E <sub>17</sub>	u	I <sub>Q2</sub> = E <sub>17</sub> / 2000	-3.0 -0.5 u
	I <sub>Q3</sub>	21	41.25	---	41.25	0	1.4	---	---	K3	12-13	E <sub>18</sub>	u	I <sub>Q3</sub> = E <sub>18</sub> / 2000	-5.0 -1.0 u
$T_A = +125^\circ C$	V <sub>START</sub>	22	4.25	-500	10	0	---	-0.425	---	K4	9-11	E <sub>19</sub>	V <sub>START</sub> = E <sub>19</sub>	See figure 9 waveforms	1.20 1.30 V
	V <sub>OUT1</sub>	23	4.25	-5	4.25	0	1.4	---	---	None	9-11	E <sub>20</sub>	V <sub>OUT1</sub> = E <sub>20</sub>	1.20 1.30 V	
	V <sub>OUT2</sub>	24	4.25	-500	4.25	-4.95	---	---	---	E <sub>21</sub>	u	V <sub>OUT2</sub> = E <sub>21</sub>	u	u u	
	V <sub>OUT3</sub>	25	41.25	-5	41.25	0	-0.45	---	---	E <sub>22</sub>	u	V <sub>OUT3</sub> = E <sub>22</sub>	u	u u	
	V <sub>OUT4</sub>	26	41.25	-50	41.25	-0.45	---	---	---	E <sub>23</sub>	u	V <sub>OUT4</sub> = E <sub>23</sub>	u	u u	
	V <sub>RLINE</sub>	27	---	---	---	---	---	---	---	---	---	V <sub>RLINE</sub> = E <sub>20</sub> - E <sub>22</sub>	See figure 9 waveforms	23 mV	
$T_A = +125^\circ C$	VRLOAD1	28	6.25	-5	6.25	0	---	---	---	E <sub>24</sub>	u	V <sub>LOAD1</sub> = E <sub>24</sub> - E <sub>25</sub>	---	u u	
	VRLOAD1	29	6.25	-500	6.25	-4.95	---	---	---	E <sub>25</sub>	u	V <sub>LOAD2</sub> = E <sub>22</sub> - E <sub>23</sub>	figure 9	12 u	
	VRLOAD3	30	---	---	---	---	---	---	---	E <sub>26</sub>	---	VRTH = E <sub>26</sub>	---	12 12 u	

TABLE III. Group A inspection for all device type 03 – Continued.

Subgroup	Symbol	Test no.	Test conditions	See figure 9 Applied test voltages (volts) (Hi – Lo pin potential)								Relays energized	Measurement sense lines	Equation	Notes	Limits	Unit						
				V <sub>IN</sub> (volts)		I <sub>L</sub> (mA)		1-2 4-5		6-11 7-2													
				Pins	Value	Pins	Value	Pins	Value	Pins	Value												
$T_A = +125^\circ C$	I <sub>ADJ</sub>	31	4.25	-5	4.25	0	---	---	---	K2	12-13	E <sub>26</sub> E <sub>27</sub>	---	I <sub>ADJ</sub> = E <sub>26</sub> / 2000	-100	-15	$\mu A$						
	I <sub>ADJ</sub>	32	41.25	-5	41.25	0	---	---	---	---	---	---	---	I <sub>ADJ</sub> = E <sub>27</sub> / 2000	-100	-15	"						
	$\Delta I_{ADJ}$	33	---	---	---	---	---	---	---	---	---	---	---	$\Delta I_{ADJ} = (E_{26} - E_{27}) / 2000$ (LINE)	-5	5	"						
	$\Delta I_{ADJ}$	34	6.25	-5	6.25	0	---	---	---	---	---	E <sub>28</sub>	---	$\Delta I_{ADJ} = (E_{28} - E_{29}) / 2000$ (LOAD)	-5	5	"						
	$\Delta I_{ADJ}$	35	6.25	-500	6.25	-4.95	---	---	---	---	---	E <sub>29</sub>	---	$\Delta I_{ADJ} = (E_{28} - E_{29}) / 2000$ (LOAD)	-5	5	"						
	I <sub>OS1</sub>	36	4.25	---	10	---	---	0.425	0	K4,K5	10-5	E <sub>30</sub> E <sub>31</sub>	V	$I_{OS1} = E_{30}$ V <sub>OUT5</sub> = E <sub>31</sub> (RECOV)	-1.8	-0.5	A						
	V <sub>OUT5</sub> (RECOV)	37	4.25	---	10	---	---	0.425	15	K4,K5	9-11	---	---	V <sub>OUT5</sub> = E <sub>31</sub> (RECOV)	1.20	1.30	V						
	I <sub>OS2</sub>	38	40	---	40	---	---	0	0	K5	10-5	E <sub>32</sub>	---	$I_{OS2} = E_{32}$ (RECOV)	-0.5	-0.05	A						
	V <sub>OUT6</sub> (RECOV)	39	40	---	40	---	---	15	15	K5	9-11	E <sub>33</sub>	---	$V_{OUT6} = E_{33}$ (RECOV)	1.20	1.30	V						
	I <sub>Q1</sub>	40	4.25	---	4.25	0	1.4	---	---	K3	12-13	E <sub>34</sub>	---	I <sub>Q1</sub> = E <sub>34</sub> / 2000	-3.0	-0.5	$\mu A$						
$T_A = -55^\circ C$	I <sub>Q2</sub>	41	14.25	---	14.25	0	1.4	---	---	K3	12-13	E <sub>35</sub>	---	I <sub>Q2</sub> = E <sub>35</sub> / 2000	-3.0	-0.5	"						
	I <sub>Q3</sub>	42	41.25	---	41.25	0	1.4	---	---	K3	12-13	E <sub>36</sub>	---	I <sub>Q3</sub> = E <sub>36</sub> / 2000	-5.0	-1.0	"						
	V <sub>START</sub>	43	4.25	-500	10	0	---	-0.425	---	K4	9-11	E <sub>37</sub>	---	V <sub>START</sub> = E <sub>37</sub>	See figure 9 waveforms	1.20	1.30	V					
	V <sub>OUT7</sub>	44	6.25	-5	6.25	0	---	---	---	None	---	E <sub>38</sub>	---	$V_{OUT7} = E_{38}$	1.20	1.30	V						
$T_A = +150^\circ C$	V <sub>OUT1</sub>	45	4.25	-5	4.25	0	---	---	---	None	9-11	E <sub>39</sub> E <sub>40</sub> E <sub>41</sub> E <sub>42</sub>	V	$V_{OUT1} = E_{39}$ $V_{OUT2} = E_{40}$ $V_{OUT3} = E_{41}$ $V_{OUT4} = E_{42}$	1.20	1.30	V						
	V <sub>OUT2</sub>	46	4.25	-500	4.25	-4.95	---	---	---	---	---	---	---	$V_{OUT1} = E_{39}$ $V_{OUT2} = E_{40}$ $V_{OUT3} = E_{41}$ $V_{OUT4} = E_{42}$	---	---	"						
	V <sub>OUT3</sub>	47	41.25	-5	41.25	0	---	---	---	---	---	---	---	$V_{OUT1} = E_{39}$ $V_{OUT2} = E_{40}$ $V_{OUT3} = E_{41}$ $V_{OUT4} = E_{42}$	---	---	"						
	V <sub>OUT4</sub>	48	41.25	-50	41.25	-0.45	---	---	---	---	---	---	---	$V_{OUT1} = E_{39}$ $V_{OUT2} = E_{40}$ $V_{OUT3} = E_{41}$ $V_{OUT4} = E_{42}$	---	---	"						
$T_A = -55^\circ C$	V <sub>RLINE1</sub>	49	---	---	---	---	---	---	---	---	---	---	---	$V_{RLINE} = E_{39} - E_{41}$	See figure 9 waveforms	23	23	mV					
	V <sub>RLOAD1</sub>	50	6.25	-5	6.25	0	---	---	---	---	---	---	---	$V_{RLOAD1} = E_{43} - E_{44}$	---	---	"						
	V <sub>RLOAD1</sub>	51	6.25	-500	6.25	-4.95	---	---	---	---	---	---	---	$V_{RLOAD2} = E_{41} - E_{42}$	---	12	"						
	V <sub>RLOAD2</sub>	52	---	---	---	---	---	---	---	---	---	---	---	$V_{RLOAD2} = E_{41} - E_{42}$	---	12	"						
	I <sub>ADJ</sub>	53	4.25	-5	4.25	0	---	---	---	K2	12-13	E <sub>45</sub> E <sub>46</sub>	---	I <sub>ADJ</sub> = E <sub>45</sub> / 2000	-100	-15	$\mu A$						
	I <sub>ADJ</sub>	54	41.25	-5	41.25	0	---	---	---	---	---	---	---	I <sub>ADJ</sub> = E <sub>46</sub> / 2000	-100	-15	"						
	$\Delta I_{ADJ}$	55	---	---	---	---	---	---	---	---	---	---	---	$\Delta I_{ADJ} = (E_{45} - E_{46}) / 2000$ (LINE)	-5	5	"						
$T_A = +125^\circ C$	$\Delta I_{ADJ}$	56	6.25	-5	6.25	0	---	---	---	---	---	E <sub>47</sub>	---	$\Delta I_{ADJ} = (E_{47} - E_{48}) / 2000$ (LINE)	-5	5	"						
	$\Delta I_{ADJ}$	57	6.25	-500	6.25	-4.95	---	---	---	---	---	E <sub>48</sub>	---	$\Delta I_{ADJ} = (E_{47} - E_{48}) / 2000$ (LINE)	-5	5	"						

TABLE III. Group A inspection for all device type 03 – Continued.

Subgroup	Symbol	Test no.	Test conditions				See figure 9 Applied test voltages (volts) (Hi – Lo pin potential)				Relays energized				Measurement sense lines				Equation		Notes	Limits	Unit		
			$V_{IN}$ (volts)	$I_L$ (mA)	1-2	4-5	6-11	7-2	8-2		Pins	Value	Units	10-5	E49	V	10-5	E49	V	See figure 9 waveforms	-0.5	A			
$T_A = -55^\circ C$	IoS1	58	4.25	---	10	---	---	-0.425	0	K4,K5	9-11	E50	"							See figure 9 waveforms	-1.8	-0.5	A		
	$V_{OUT5}$ (RECOV)	59	4.25	---	10	---	---	-0.425	15	K4,K5	10-5	E49	"							$V_{OUT5} = E_{50}$ (RECOV)	1.20	1.30	V		
	IoS2	60	40	40	40	40	40	40	40	0	K5	10-5	E51	"						$I_{o5} = E_{51}$	-0.5	-0.05	A		
	$V_{OUT6}$ (RECOV)	61	40	40	40	40	40	40	40	15	K5	9-11	E52	"						$V_{OUT6} = E_{52}$ (RECOV)	1.20	1.30	V		
	IQ1	62	4.25	---	4.25	0	1.4	---	---	K3	12-13	E53	"							$I_{Q1} = E_{53} / 2000$	-3.0	-0.5	mA		
	IQ2	63	14.25	---	14.25	0	1.4	---	---	K3	12-13	E54	"							$I_{Q2} = E_{54} / 2000$	-3.0	-0.5	"		
	IQ3	64	41.25	---	41.25	0	1.4	---	---	K3	12-13	E55	"							$I_{Q3} = E_{55} / 2000$	-5.0	-1.0	"		
	VSTART	65	4.25	-500	10	0	---	-0.425	---	K4	9-11	E56	"							$V_{START} = E_{56}$	See figure 9 waveforms	1.20	1.30	V	
Subgroup	Symbol	Test no.	Test conditions				Load current				Measurement sense lines				Equation				Notes	Limits	Unit				
			Input voltage	$V_{IN} = 6.25 V$	$I_L = -125 mA$	Symbol	Value	Units	Symbol	Value	Units	Symbol	Value	Units	Symbol	Value	Units	Min				Max			
$T_A = +25^\circ C$	$\Delta V_{IN} / \Delta V_{OUT}$	66	$V_{IN} = 6.25 V$	$I_L = -125 mA$	$e_{0ms}$	$E_{57}$	$V_{rms}$	$\Delta V_{IN} / \Delta V_{OUT} = -20 \log E_{57}$							65	---	dB								
	$V_{NO}$	67	$V_{IN} = 6.25 V$	$I_L = -50 mA$	$e_{0ms}$	$E_{58}$	$V_{rms}$	$V_{NO} = E_{58}$							11										
$T_A = +25^\circ C$	$\Delta V_{OUT} / \Delta V_{IN}$	68	$V_{IN} = 6.25 V$	$I_L = -10 mA$	$V_{OUT}$	$E_{59}$	$V$	$\Delta V_{OUT} / \Delta V_{IN} = E_{59} / 3$							See figure 12	---	120	$\mu V_{rms}$							
	$\Delta V_{OUT} / \Delta I_L$	69	$\Delta V_{IN} = 3.0 V$	$I_L = -50 mA$	$V_{OUT}$	$E_{60}$	$V$	$\Delta V_{OUT} / \Delta I_L = E_{60} / 200$							See figure 13	---	6	mV/V							

TABLE III. Group A inspection for all device type 04.

Subgroup	Symbol	Test no.	Test conditions	See figure 9 Applied test voltages (volts) (Hi – Lo pin potential)				Relays energized				Measurement sense lines				Equation	Notes	Limits	Unit
				V <sub>IN</sub> (volts)	I <sub>L</sub> (mA)	1-2	4-5	6-11	7-2	8-2		Pins	Value	Units					
$T_A = +25^\circ C$	V <sub>OUT1</sub>	1	4.25	-5	4.25	0	---	---	---	---	None	9-11	E <sub>1</sub>	V	V <sub>OUT1</sub> = E <sub>1</sub>		1.20	1.30	V
	V <sub>OUT2</sub>	2	4.25	-1500	4.25	-14.95	0	---	---	---	"	E <sub>2</sub>	"	"	V <sub>OUT2</sub> = E <sub>2</sub>		"	"	"
	V <sub>OUT3</sub>	3	41.25	-5	41.25	0	---	---	---	---	"	E <sub>3</sub>	"	"	V <sub>OUT3</sub> = E <sub>3</sub>		"	"	"
	V <sub>OUT4</sub>	4	41.25	-200	41.25	-1.95	0	---	---	---	"	E <sub>4</sub>	"	"	V <sub>OUT4</sub> = E <sub>4</sub>		"	"	"
	V <sub>RLINE</sub>	5	---	---	---	---	---	---	---	---	"	"	---	"	V <sub>RLINE</sub> = E <sub>1</sub> – E <sub>3</sub>	See figure 9 waveforms	-9	9	mV
	V <sub>RLOAD1</sub>	6	6.25	-5	6.25	0	---	---	---	---	"	"	"	"	V <sub>RLOAD1</sub> = E <sub>5</sub> – E <sub>6</sub>	See figure 9 waveforms	---	---	"
	V <sub>RLOAD1</sub>	7	6.25	-1500	6.25	-14.95	0	---	---	---	"	E <sub>6</sub>	"	"	V <sub>RLOAD2</sub> = E <sub>3</sub> – E <sub>4</sub>	See figure 9 waveforms	-3.5	3.5	"
	V <sub>RLOAD2</sub>	8	---	---	---	---	---	---	---	---	"	"	"	"	V <sub>RTH</sub> = E <sub>7</sub>	See figure 9 waveforms, $t = 20.5 \text{ ms}$	-12	12	"
	V <sub>RTH</sub>	9	14.6	-1500	14.6	-14.95	0	---	---	---	"	E <sub>7</sub>	"	"					
	I <sub>ADJ</sub>	10	4.25	-5	4.25	0	---	---	---	---	K2	12-13	E <sub>8</sub>	mV	I <sub>ADJ</sub> = E <sub>8</sub> / 2000		-100	-15	µA
$T_A = +125^\circ C$	I <sub>ADJ</sub>	11	41.25	-5	41.25	0	---	---	---	---	"	"	"	"	I <sub>ADJ</sub> = E <sub>9</sub> / 2000		-100	-15	"
	$\Delta I_{ADJ}$ (LINE)	12	---	---	---	---	---	---	---	---	"	"	"	"	$\Delta I_{ADJ} = (E_8 - E_9) / 2000$ (LINE)		-5	5	"
	$\Delta I_{ADJ}$ (LOAD)	13	6.25	-5	6.25	0	---	---	---	---	"	"	"	"	$\Delta I_{ADJ} = (E_{10} - E_{11}) / 2000$ (LOAD)		-5	5	"
	$\Delta I_{ADJ}$ (LOAD)	14	6.25	-1500	6.25	-14.95	0	---	---	---	"	"	"	"					
	I <sub>OS1</sub>	15	4.25	---	10	---	---	---	---	---	K4, K5	10-5	E <sub>12</sub>	V	I <sub>OS1</sub> = E <sub>12</sub>	See figure 9 waveforms	-3.5	-1.5	A
	V <sub>OUT5</sub> (RECOV)	16	4.25	---	10	---	---	---	---	---	K4, K5	9-11	E <sub>13</sub>	"	V <sub>OUT5</sub> = E <sub>13</sub> (RECOV)		1.20	1.30	V
	I <sub>OS2</sub>	17	40	---	40	---	---	---	---	0	K5	10-5	E <sub>14</sub>	"	I <sub>OS2</sub> = E <sub>14</sub>		-1.00	-0.18	A
	V <sub>OUT6</sub> (RECOV)	18	40	---	40	---	---	---	15	K5	9-11	E <sub>15</sub>	"	V <sub>OUT6</sub> = E <sub>15</sub> (RECOV)		1.20	1.30	V	
	I <sub>Q1</sub>	19	4.25	---	4.25	0	1.4	---	---	K3	12-13	E <sub>16</sub>	"	I <sub>Q1</sub> = E <sub>16</sub> / 2000	See figure 9 waveforms	-3.0	-0.2	mA	
	I <sub>Q2</sub>	20	14.25	---	14.25	0	1.4	---	---	K3	12-13	E <sub>17</sub>	"	I <sub>Q2</sub> = E <sub>17</sub> / 2000		-3.0	-0.2	"	
	I <sub>Q3</sub>	21	41.25	---	41.25	0	1.4	---	---	K3	12-13	E <sub>18</sub>	"	I <sub>Q3</sub> = E <sub>18</sub> / 2000		-5.0	-1.0	"	
	V <sub>START</sub>	22	4.25	-1500	10	0	---	-0.425	---	K4	9-11	E <sub>19</sub>	"	V <sub>START</sub> = E <sub>19</sub>	See figure 9 waveforms	1.20	1.30	V	
$T_A = +125^\circ C$	V <sub>OUT1</sub>	23	4.25	-5	4.25	0	---	---	---	None	9-11	E <sub>20</sub>	V	V <sub>OUT1</sub> = E <sub>20</sub>		1.20	1.30	V	
	V <sub>OUT2</sub>	24	4.25	-1500	4.25	-14.95	0	---	---	"	E <sub>21</sub>	"	"	V <sub>OUT2</sub> = E <sub>21</sub>		"	"	"	
	V <sub>OUT3</sub>	25	41.25	-5	41.25	0	---	---	---	"	E <sub>22</sub>	"	"	V <sub>OUT3</sub> = E <sub>22</sub>		"	"	"	
	V <sub>OUT4</sub>	26	41.25	-200	41.25	-1.95	0	---	---	"	E <sub>23</sub>	"	"	V <sub>OUT4</sub> = E <sub>23</sub>		"	"	"	
	V <sub>RLINE</sub>	27	---	---	---	---	---	---	---	"	"	---	"	V <sub>RLINE</sub> = E <sub>20</sub> – E <sub>22</sub>	See figure 9 waveforms	---	23	mV	
	V <sub>RLOAD1</sub>	28	6.25	-5	6.25	0	---	---	---	"	"	---	"	$\Delta V_{RLOAD1} = E_{24} - E_{25}$	See figure 9 waveforms	---	---	"	
	V <sub>RLOAD1</sub>	29	6.25	-1500	6.25	-14.95	0	---	---	"	E <sub>25</sub>	"	"	V <sub>RLOAD2</sub> = E <sub>22</sub> – E <sub>23</sub>	See figure 9 waveforms	-12	12	"	
	V <sub>RLOAD2</sub>	30	---	---	---	---	---	---	---	"	E <sub>25</sub>	"	"	V <sub>RTH</sub> = E <sub>24</sub> – E <sub>25</sub>	See figure 9 waveforms	-12	12	"	

TABLE III. Group A inspection for all device type 04 – Continued.

Subgroup	Symbol	Test no.	Test conditions	See figure 9 Applied test voltages (volts) (Hi – Lo pin potential)				Relays energized		Measurement sense lines		Equation	Notes	Limits	Unit		
				V <sub>IN</sub> (volts)	I <sub>L</sub> (mA)	1-2	4-5	6-11	7-2	8-2		Pins	Value	Units			
$T_A = +125^\circ C$	I <sub>ADJ</sub>	31	4.25	-5	4.25	0	---	---	---	K2	12-13	E <sub>26</sub> E <sub>27</sub>	mV	$ \Delta I_{ADJ}  = E_{26} / 2000$	-100	-15	$\mu A$
	I <sub>ADJ</sub>	32	41.25	-5	41.25	0	---	---	---	"	"	"	"	$ \Delta I_{ADJ}  = E_{27} / 2000$	-100	-15	"
	$\Delta I_{ADJ}$ (LINE)	33	---	---	---	---	---	---	---	"	"	"	"	$\Delta  \Delta I_{ADJ}  = (E_{26} - E_{27}) / 2000$ (LINE)	-5	5	"
	$\Delta I_{ADJ}$ (LOAD)	34	6.25	-5	6.25	0	---	---	---	"	"	E <sub>28</sub>	"	$\Delta  \Delta I_{ADJ}  = (E_{28} - E_{29}) / 2000$ (LOAD)	-5	5	"
	$\Delta I_{ADJ}$ (LOAD)	35	6.25	-1500	6.25	-14.95	---	---	---	"	"	E <sub>29</sub>	"	$\Delta  \Delta I_{ADJ}  = (E_{28} - E_{29}) / 2000$ (LOAD)	-5	5	"
	I <sub>O5</sub>	36	4.25	---	10	---	---	-0.425	0	K4,K5	10-5	E <sub>30</sub>	V	See figure 9 waveforms	-3.5	-1.5	A
	V <sub>OUT5</sub> (RECOV)	37	4.25	---	10	---	---	-0.425	15	K4,K5	9-11	E <sub>31</sub>	"		1.20	1.30	V
	I <sub>O5</sub>	38	40	---	40	---	---	---	0	K5	10-5	E <sub>32</sub>	"		-1.00	-0.18	A
	V <sub>OUT6</sub> (RECOV)	39	40	---	40	---	---	---	15	K5	9-11	E <sub>33</sub>	"		1.20	1.30	V
	I <sub>Q1</sub>	40	4.25	---	4.25	0	1.4	---	---	K3	12-13	E <sub>34</sub>	"	See figure 9 waveforms	-3.0	-0.2	$\mu A$
	I <sub>Q2</sub>	41	14.25	---	14.25	0	1.4	---	---	K3	12-13	E <sub>35</sub>	"		-3.0	-0.2	"
	I <sub>Q3</sub>	42	41.25	---	41.25	0	1.4	---	---	K3	12-13	E <sub>36</sub>	"		-5.0	-1.0	"
	V <sub>START</sub>	43	4.25	-1500	10	0	---	-0.425	---	K4	9-11	E <sub>37</sub>	"	See figure 9 waveforms	1.20	1.30	V
	V <sub>OUT7</sub>	44	6.25	-5	6.25	0	---	---	---	None	"	E <sub>38</sub>	"		1.20	1.30	V
	V <sub>OUT7</sub>	45	4.25	-5	4.25	0	---	---	---	None	9-11	E <sub>39</sub>	V		1.20	1.30	V
	V <sub>OUT7</sub>	46	4.25	-1500	4.25	-14.95	---	---	---	E <sub>40</sub>	"	V <sub>OUT1</sub> = E <sub>39</sub>	"		"	"	"
	V <sub>OUT3</sub>	47	41.25	-5	41.25	0	---	---	---	E <sub>41</sub>	"	V <sub>OUT2</sub> = E <sub>40</sub>	"		"	"	"
	V <sub>OUT4</sub>	48	41.25	-200	41.25	-1.95	---	---	---	E <sub>42</sub>	"	V <sub>OUT3</sub> = E <sub>41</sub>	"		"	"	"
	V <sub>LINE1</sub>	49	---	---	---	---	---	---	---	---	---	V <sub>LINE</sub> = E <sub>39</sub> – E <sub>41</sub>	"	See figure 9 waveforms	-23	23	mV
	VR <sub>LOAD1</sub>	50	6.25	-5	6.25	0	---	---	---	E <sub>43</sub>	"	"	"		---	---	"
	VR <sub>LOAD1</sub>	51	6.25	-1500	6.25	-14.95	---	---	---	E <sub>44</sub>	"	VR <sub>LOAD1</sub> = E <sub>43</sub> – E <sub>44</sub>	"		-12	12	"
	VR <sub>LOAD2</sub>	52	---	---	---	---	---	---	---	E <sub>44</sub>	"	VR <sub>LOAD2</sub> = E <sub>41</sub> – E <sub>42</sub>	"		-12	12	"
$T_A = -55^\circ C$	I <sub>ADJ</sub>	53	4.25	-5	4.25	0	---	---	---	K2	12-13	E <sub>45</sub>	mV	$ \Delta I_{ADJ}  = E_{45} / 2000$	-100	-15	$\mu A$
	I <sub>ADJ</sub>	54	41.25	-5	41.25	0	---	---	---	E <sub>46</sub>	"	$ \Delta I_{ADJ}  = E_{46} / 2000$	"	$ \Delta I_{ADJ}  = (E_{45} - E_{46}) / 2000$ (LINE)	-100	-15	"
	$\Delta I_{ADJ}$ (LINE)	55	---	---	---	---	---	---	---	---	---	E <sub>47</sub>	"	$ \Delta I_{ADJ}  = (E_{47} - E_{48}) / 2000$ (LOAD)	-5	5	"
	$\Delta I_{ADJ}$ (LOAD)	56	6.25	-5	6.25	0	---	---	---	E <sub>48</sub>	"	$ \Delta I_{ADJ}  = (E_{47} - E_{48}) / 2000$ (LOAD)	-5	5	"		
	$\Delta I_{ADJ}$ (LOAD)	57	6.25	-1500	6.25	-14.95	---	---	---	E <sub>48</sub>	"	$ \Delta I_{ADJ}  = (E_{47} - E_{48}) / 2000$ (LOAD)	-5	5	"		
	V <sub>LINE1</sub>	58	---	---	---	---	---	---	---	V <sub>LINE</sub>	---	V <sub>LINE</sub> = E <sub>39</sub> – E <sub>41</sub>	"	See figure 9 waveforms	-23	23	mV
	VR <sub>LOAD1</sub>	59	6.25	-5	6.25	0	---	---	---	V <sub>LOAD1</sub>	---	VR <sub>LOAD1</sub> = E <sub>43</sub> – E <sub>44</sub>	"		-12	12	"
	VR <sub>LOAD2</sub>	60	---	---	---	---	---	---	---	V <sub>LOAD2</sub>	---	VR <sub>LOAD2</sub> = E <sub>41</sub> – E <sub>42</sub>	"	---	-12	12	"

TABLE III. Group A inspection for all device type 04 – Continued.

Subgroup	Symbol	Test no.	Test conditions		See figure 9 Applied test voltages (volts) (Hi – Lo pin potential)				Relays energized		Measurement sense limits		Equation	Notes	Limits	Unit		
			V <sub>IN</sub> (volts)	I <sub>L</sub> (mA)	1-2	4-5	6-11	7-2	8-2	Pins	Value	Units	Min	Max				
$T_A = -55^{\circ}\text{C}$	I <sub>O1</sub>	58	4.25	---	10	---	---	-0.425	0	K4,K5	10-5	E <sub>49</sub> E <sub>50</sub>	"	I <sub>O1</sub> = E <sub>49</sub> V <sub>OUT5</sub> = E <sub>50</sub> (RECOV)	See figure 9 waveforms	-3.5 1.20	-1.5 1.30	A V
	V <sub>OUT5</sub> (RECOV)	59	4.25	---	10	---	---	-0.425	15	K4,K5	9-11	E <sub>50</sub>	"	V <sub>OUT5</sub> = E <sub>50</sub> (RECOV)		-1.00	-0.18	A
	I <sub>O2</sub>	60	40	---	40	---	---	---	0	K5	10-5	E <sub>51</sub> E <sub>52</sub>	"	I <sub>O2</sub> = E <sub>51</sub> V <sub>OUT6</sub> = E <sub>52</sub> (RECOV)		1.20	1.30	V
	V <sub>OUT6</sub> (RECOV)	61	40	---	40	---	---	---	15	K5	9-11	E <sub>52</sub>	"	V <sub>OUT6</sub> = E <sub>52</sub> (RECOV)		1.20	1.30	V
	I <sub>Q1</sub>	62	4.25	---	4.25	0	1.4	---	---	K3	12-13	E <sub>53</sub> E <sub>54</sub>	"	I <sub>Q1</sub> = E <sub>53</sub> / 2000 I <sub>Q2</sub> = E <sub>54</sub> / 2000		-3.0 -3.0	-0.2 -0.2	mA "
	I <sub>Q2</sub>	63	14.25	---	14.25	0	1.4	---	---	K3	12-13	E <sub>54</sub> E <sub>55</sub>	"	I <sub>Q3</sub> = E <sub>55</sub> / 2000		-5.0	-1.0	mA "
	I <sub>Q3</sub>	64	41.25	---	41.25	0	1.4	---	---	K3	12-13	E <sub>55</sub>	"	V <sub>START</sub> = E <sub>56</sub>	See figure 9 waveforms	1.20	1.30	V
	V <sub>START</sub>	65	4.25	-1500	10	0	---	-0.425	---	K4	9-11	E <sub>56</sub>	"					
Subgroup			Test conditions				Measurement sense lines				Equation		Notes		Limits		Unit	
$T_A = +25^{\circ}\text{C}$	4	66	Input voltage		Load current		Symbol		Value		Units		Min		Max			
	$\Delta V_{IN} / \Delta V_{OUT}$		$V_{IN} = 6.25\text{ V}$ $e_i = 1.0\text{ Vrms}$ at 2400 Hz		$I_L = -500\text{ mA}$		$e_{0rms}$		$E_{57}$		$\Delta V_{IN} / \Delta V_{OUT} = -20\log E_{57}$		See figure 11		65		---	
	$V_{NO} / \Delta V_{IN}$	67	$V_{IN} = 6.25\text{ V}$		$I_L = -100\text{ mA}$		$e_{0rms}$		$E_{58}$		$V_{NO} = E_{58}$		See figure 12		---		120	
	$V_{NO} / \Delta V_{IN}$	68	$V_{IN} = 6.25\text{ V}$ $\Delta V_{IN} = 3.0\text{ V}$		$I_L = -10\text{ mA}$		$V_{OUT}$		$E_{59}$		$\Delta V_{OUT} / \Delta V_{IN} = E_{59} / 3$		See figure 13		---		6	
$T_A = +25^{\circ}\text{C}$	$\Delta V_{OUT} / \Delta I_L$	69	$V_{IN} = 6.25\text{ V}$		$I_L = -100\text{ mA}$		$V_{OUT}$		$E_{60}$		$\Delta V_{OUT} / \Delta I_L = E_{60} / 200$		See figure 14		---		0.30	
	$\Delta I_L$																	

TABLE III. Group A inspection for all device type 05.

Subgroup	Symbol	Test no.	Test conditions	See figure 10 Applied test voltages (volts) (Hi – Lo pin potential)				Relays energized		Measurement sense lines				Equation	Notes	Limits	Unit	
				V <sub>IN</sub> (volts)	I <sub>L</sub> (mA)	1-2	4-5	6-11	7-2	8-2	Pins	Value	Units					
$T_A = +25^\circ C$	V <sub>OUT1</sub>	1	4.25	-5	15	0	---	-0.425	---	None	9-11	E <sub>1</sub>	V	$V_{OUT1} = E_1$	See figure 10 waveforms	1.20	1.30	V
	V <sub>OUT2</sub>	2	4.25	-3000	15	-2.995	---	-0.425	---	“	E <sub>2</sub>	“	“	$V_{OUT2} = E_2$	See figure 10 waveforms	“	“	“
	V <sub>OUT3</sub>	3	36.25	-5	42.5	0	---	-3.625	---	“	E <sub>3</sub>	“	“	$V_{OUT3} = E_3$	See figure 10 waveforms	“	“	“
	V <sub>OUT4</sub>	4	36.25	-150	42.5	-0.145	---	-3.625	---	“	E <sub>4</sub>	“	“	$V_{OUT4} = E_4$	See figure 10 waveforms	“	“	“
	V <sub>RLINE</sub>	5	---	---	---	---	---	---	---	“	“	“	“	$V_{RLINE} = E_1 - E_3$	See figure 10 waveforms	-4	4	mV
	V <sub>RLOAD1</sub>	6	6.25	-5	15	0	---	-0.625	---	“	E <sub>5</sub>	“	“	$V_{RLOAD1} = E_5 - E_6$	See figure 10 waveforms	“	“	“
	V <sub>RLOAD1</sub>	7	6.25	-3000	15	-2.995	---	-0.625	---	“	E <sub>6</sub>	“	“	$V_{RLOAD2} = E_3 - E_4$	See figure 10 waveforms	“	“	“
	V <sub>RLOAD2</sub>	8	---	---	---	---	---	---	---	“	“	“	“	$V_{RTH} = E_7$	See figure 10 waveforms, $t = 20.5\text{ ms}$	-5	5	“
	V <sub>RTH</sub>	9	11.25	-1000	25	-0.995	---	-1.125	---	“	E <sub>7</sub>	“	“					
	I <sub>ADJ</sub>	10	4.25	-5	15	0	---	-0.425	---	K2	12-13	E <sub>8</sub>	mV	$I_{ADJ} = E_8 / 2000$		-100	-15	μA
$T_A = +125^\circ C$	I <sub>ADJ</sub>	11	36.25	-5	42.5	0	---	-3.625	---	“	E <sub>9</sub>	“	“	$I_{ADJ} = E_9 / 2000$		-100	-15	“
	$\Delta I_{ADJ}$ (LINE)	12	---	---	---	---	---	---	---	“	“	---	“	$\Delta I_{ADJ} = (E_8 - E_9) / 2000$ (LINE)		-5	5	“
	$\Delta I_{ADJ}$ (LOAD)	13	6.25	-5	15	0	---	-0.625	---	“	E <sub>10</sub>	“	“	$\Delta I_{ADJ} = (E_{10} - E_{11}) / 2000$ (LOAD)		-5	5	“
	$\Delta I_{ADJ}$ (LOAD)	14	6.25	-3000	15	-2.995	---	-0.625	---	“	E <sub>11</sub>	“	“					
	I <sub>O1</sub>	15	4.25	---	15	---	---	-0.425	0	K4,K5	10-5	E <sub>12</sub>	V	$I_{O1} = 4E_{12}$	See figure 10 waveforms	-5.2	-3.0	A
	V <sub>OUT5</sub> (RECOV)	16	4.25	---	15	---	---	-0.425	15	K4,K5	9-11	E <sub>13</sub>	V	$V_{OUT5} = E_{13}$ (RECOV)	1.20	1.30	V	
	I <sub>O2</sub>	17	35	---	42.5	---	---	-3.5	0	K5	10-5	E <sub>14</sub>	“	$I_{O2} = 4E_{14}$	See figure 10 waveforms	-2.00	-0.15	A
	I <sub>O3</sub>	18	35	---	42.5	---	---	-3.5	15	K5	9-11	E <sub>15</sub>	“	$V_{OUT6} = E_{15}$ (RECOV)	1.20	1.30	V	
	V <sub>START</sub>	22	4.25	-3000	15	0	---	-0.425	---	K4	9-11	E <sub>19</sub>	“	$V_{START} = E_{19}$	See figure 10 waveforms	-5	5	“
	V <sub>OUT1</sub>	23	4.25	-5	15	0	---	-0.425	---	None	9-11	E <sub>20</sub>	V	$V_{OUT1} = E_{20}$	1.20	1.30	mA	
	V <sub>OUT2</sub>	24	4.25	-3000	15	-2.995	---	-0.425	---	“	E <sub>21</sub>	“	“	$V_{OUT2} = E_{21}$	See figure 10 waveforms	“	“	“
$T_A = +125^\circ C$	V <sub>OUT3</sub>	25	36.25	-5	42.5	0	---	-3.625	---	“	E <sub>22</sub>	“	“	$V_{OUT3} = E_{22}$	See figure 10 waveforms	“	“	“
	V <sub>OUT4</sub>	26	36.25	-150	42.5	-0.145	---	-3.625	---	“	E <sub>23</sub>	“	“	$V_{OUT4} = E_{23}$	See figure 10 waveforms	“	“	“
	V <sub>RLINE1</sub>	27	---	---	---	---	---	---	---	“	“	---	“	$V_{RLINE} = E_{20} - E_{22}$	See figure 10 waveforms	-20	20	mV
	V <sub>RLOAD1</sub>	28	6.25	-5	15	0	---	-0.625	---	“	E <sub>24</sub>	“	“	$V_{RLOAD1} = E_{24} - E_{25}$	See figure 10 waveforms	“	“	“
	V <sub>RLOAD1</sub>	29	6.25	-3000	15	-2.995	---	-0.625	---	“	E <sub>25</sub>	“	“	$V_{RLOAD2} = E_{22} - E_{23}$	See figure 10 waveforms	-12	12	“
	V <sub>RLOAD2</sub>	30	---	---	---	---	---	---	---	“	“	---	“			-12	12	“

TABLE III. Group A inspection for all device type 05 – Continued.

Subgroup	Symbol	Test no.	Test conditions	See figure 10 Applied test voltages (volts) (Hi – Lo pin potential)				Relays energized		Measurement sense lines		Equation	Notes	Limits	Unit			
				V <sub>IN</sub> (volts)	I <sub>L</sub> (mA)	1-2	4-5	6-11	7-2	8-2		Pins	Value	Units				
$T_A = +125^\circ C$	I <sub>ADJ</sub>	31	4.25	-5	15	0	---	-0.425	---	K2	12-13	E <sub>26</sub> E <sub>27</sub>	mV	$\Delta I_{ADJ} = E_{26} / 2000$	-100 -100	-15 -15	$\mu A$	
	I <sub>ADJ</sub>	32	36.25	-5	42.5	0	---	-3.625	---	"	"	"	"	$\Delta I_{ADJ} = E_{27} / 2000$	-100	-15	"	
	$\Delta I_{ADJ}$ (LINE)	33	---	---	---	---	---	---	---	"	"	"	"	$\Delta I_{ADJ} = (E_{26} - E_{27}) / 2000$ (LINE)	-5	5	"	
	$\Delta I_{ADJ}$ (LOAD)	34	6.25	-5	15	0	---	-0.625	---	"	"	E <sub>28</sub>	"	$\Delta I_{ADJ} = (E_{28} - E_{29}) / 2000$ (LOAD)	-5	5	"	
	$\Delta I_{ADJ}$ (LOAD)	35	6.25	-3000	15	-2.995	---	-0.625	---	"	"	E <sub>29</sub>	"	$\Delta I_{ADJ} = (E_{28} - E_{29}) / 2000$ (LOAD)	-5	5	"	
	I <sub>O5</sub>	36	4.25	---	15	---	---	-0.425	0	K4,K5	10-5	E <sub>30</sub>	V	$I_{O5} = 4E_{30}$	-5.2	-3.0	A	
	V <sub>OUT5</sub> (RECOV)	37	4.25	---	15	---	---	-0.425	15	K4,K5	9-11	E <sub>31</sub>	"	$V_{OUT5} = E_{31}$ (RECOV)	1.20	1.30	V	
	I <sub>O5</sub>	38	35	---	42.5	---	---	-3.5	0	K5	10-5	E <sub>32</sub>	"	$I_{O5} = 4E_{32}$	-2.0	-0.15	A	
	V <sub>OUT6</sub> (RECOV)	39	35	---	42.5	---	---	-3.5	15	K5	9-11	E <sub>33</sub>	"	$V_{OUT6} = E_{33}$ (RECOV)	1.20	1.30	V	
	I <sub>Q1</sub>	40	4.25	---	15	0	1.4	-0.425	---	K3	12-13	E <sub>34</sub>	"	$I_{Q1} = E_{34} / 2000$	-3.0	-0.5	$\mu A$	
$T_A = -55^\circ C$	I <sub>Q2</sub>	41	14.25	---	25	0	1.4	-1.425	---	K3	12-13	E <sub>35</sub>	"	$I_{Q2} = E_{35} / 2000$	-3.0	-0.5	"	
	I <sub>Q3</sub>	42	36.25	---	42.5	0	1.4	-3.625	---	K3	12-13	E <sub>36</sub>	"	$I_{Q3} = E_{36} / 2000$	-5.0	-0.5	"	
	V <sub>START</sub>	43	4.25	-3000	15	0	---	-0.625	---	K4	9-11	E <sub>37</sub>	"	$V_{START} = E_{37}$	See figure 10 waveforms	1.20	1.30	V
	V <sub>OUT7</sub>	44	6.25	-5	15	0	---	-0.625	---	None	"	E <sub>38</sub>	"	$V_{OUT7} = E_{38}$	1.20	1.30	V	
$T_A = +150^\circ C$	V <sub>OUT1</sub>	45	4.25	-5	15	0	---	-0.425	---	None	9-11	E <sub>39</sub>	V	$V_{OUT1} = E_{39}$	1.20	1.30	V	
	V <sub>OUT2</sub>	46	4.25	-3000	15	-2.995	---	-0.425	---	E <sub>40</sub>	"	E <sub>41</sub>	"	$V_{OUT2} = E_{40}$	"	"	"	
	V <sub>OUT3</sub>	47	36.25	-5	42.5	0	---	-3.625	---	E <sub>41</sub>	"	E <sub>42</sub>	"	$V_{OUT3} = E_{41}$	"	"	"	
	V <sub>OUT4</sub>	48	36.25	-150	42.5	-0.145	---	-3.625	---	E <sub>42</sub>	"	"	"	$V_{OUT4} = E_{42}$	"	"	"	
	V <sub>RLINE1</sub>	49	---	---	---	---	---	---	---	"	"	"	"	$V_{RLINE} = E_{39} - E_{41}$	See figure 10 waveforms	-20	20	mV
$T_A = -55^\circ C$	VR <sub>LOAD1</sub>	50	6.25	-5	15	0	---	-0.625	---	E <sub>43</sub>	"	E <sub>44</sub>	"	$VR_{LOAD1} = E_{43} - E_{44}$	---	---	"	
	VR <sub>LOAD1</sub>	51	6.25	-3000	15	-2.995	---	-0.625	---	E <sub>43</sub>	"	E <sub>44</sub>	"	$VR_{LOAD2} = E_{41} - E_{42}$	-12	12	"	
	VR <sub>LOAD2</sub>	52	---	---	---	---	---	---	---	E <sub>43</sub>	"	E <sub>44</sub>	"	$VR_{LOAD2} = E_{41} - E_{42}$	-12	12	"	
	I <sub>ADJ</sub>	53	4.25	-5	15	0	---	-0.425	---	K2	12-13	E <sub>45</sub>	mV	$I_{ADJ} = E_{45} / 2000$	-100	-15	$\mu A$	
	I <sub>ADJ</sub>	54	36.25	-5	42.5	0	---	-3.625	---	E <sub>46</sub>	"	E <sub>47</sub>	"	$I_{ADJ} = E_{46} / 2000$	-100	-15	"	
$T_A = +125^\circ C$	$\Delta I_{ADJ}$ (LINE)	55	---	---	---	---	---	---	---	"	"	"	"	$\Delta I_{ADJ} = (E_{45} - E_{46}) / 2000$ (LINE)	-5	5	"	
	$\Delta I_{ADJ}$ (LOAD)	56	6.25	-5	15	0	---	-0.625	---	E <sub>47</sub>	"	E <sub>48</sub>	"	$\Delta I_{ADJ} = (E_{47} - E_{48}) / 2000$ (LOAD)	-5	5	"	
	$\Delta I_{ADJ}$ (LOAD)	57	6.25	-3000	15	-2.995	---	-0.625	---	E <sub>47</sub>	"	E <sub>48</sub>	"	$\Delta I_{ADJ} = (E_{47} - E_{48}) / 2000$ (LOAD)	-5	5	"	

TABLE III. Group A inspection for all device type 05 – Continued.

Subgroup	Symbol	Test no.	Test conditions		See figure 10 Applied test voltages (Volts) (Hi – Lo pin potential)						Relays energized		Measurement sense limits		Equation		Notes	Limits	Unit
			V <sub>IN</sub> (volts)	I <sub>L</sub> (mA)	1-2	4-5	6-11	7-2	8-2		Pins	Value	Units	Min	Max				
$T_A = -55^{\circ}\text{C}$	I <sub>O1</sub>	58	4.25	---	15	---	-0.425	0	K4,K5	E <sub>49</sub>	V	"	-5.2	-3.0	A				
	V <sub>OUT5</sub> (RECOV)	59	4.25	---	15	---	-0.425	15	K4,K5	E <sub>50</sub>	"	See figure 10 waveforms	1.20	1.30	V				
	I <sub>O2</sub>	60	35	---	42.5	---	-3.5	0	K5	E <sub>51</sub>	"		-2.0	-0.15	A				
	V <sub>OUT6</sub> (RECOV)	61	35	---	42.5	---	-3.5	15	K5	E <sub>52</sub>	"	See figure 10 waveforms	1.20	1.30	V				
	I <sub>Q1</sub>	62	4.25	---	15	0	1.4	-0.425	---	K3	E <sub>53</sub>	"		-3.0	-0.5	mA			
	I <sub>Q2</sub>	63	14.25	---	25	0	1.4	-1.425	---	K3	E <sub>54</sub>	"		-3.0	-0.5	"			
	I <sub>Q3</sub>	64	36.25	---	42.5	0	1.4	-3.625	---	K3	E <sub>55</sub>	"		-5.0	-0.5	"			
	V <sub>START</sub>	65	4.25	-3000	0	---	0.425	---	K4	E <sub>56</sub>	"	See figure 10 waveforms	1.20	1.30	V				
Subgroup			Test conditions						Measurement sense lines		Equation		Notes		Limits		Unit		
$T_A = +25^{\circ}\text{C}$	4	66	Input voltage		Load current		Symbol		Value		Units		Min		Max		dB		
			V <sub>IN</sub> = 6.25 V	e <sub>i</sub> = 1.0 Vrms at 2400 Hz		I <sub>L</sub> = -500 mA	e <sub>0rms</sub>	E <sub>57</sub>	Vrms	$\Delta V_N / \Delta V_{OUT} = -20 \log E_{57}$	See figure 11	65	---			$\mu\text{V/rms}$			
	7	67	V <sub>IN</sub> = 6.25 V		I <sub>L</sub> = -100 mA		e <sub>0rms</sub>	E <sub>58</sub>	Vrms	V <sub>NO</sub> = E <sub>58</sub>	See figure 12	---	120			$\text{mV/V}$			
		68	V <sub>IN</sub> = 6.25 V	$\Delta V_N = 3.0$ V		I <sub>L</sub> = -10 mA	V <sub>OUT</sub>	E <sub>59</sub>	V	$\Delta V_{OUT} / \Delta V_N = E_{59} / 3$	See figure 13	---	12			$\text{mV/mA}$			
		69	V <sub>IN</sub> = 6.25 V			I <sub>L</sub> = -100 mA	V <sub>OUT</sub>	E <sub>60</sub>	V	$\Delta V_{OUT} / \Delta I_L = E_{60} / 200$	See figure 14	---	0.30						
						$\Delta I_L$													



TABLE III. Group A inspection for all device type 06 – Continued.

Subgroup	Symbol	Test no.	Test conditions	See figure 10 Applied test voltages (volts) (Hi – Lo pin potential)						Relays energized			Measurement sense lines			Equation	Notes	Limits	Unit		
				V <sub>IN</sub> (volts)	I <sub>L</sub> (mA)	1-2 4-5 6-11			7-2 8-2			Pins	Value	Units							
						15	0	---	-0.425	---	K2	12-13	E <sub>31</sub>	mV							
$T_A = +125^\circ C$	I <sub>ADJ</sub>	35	4.25	-5	42.5	15	0	---	-0.425	---	---	---	E <sub>32</sub>	"	$I_{ADJ} = E_{31} / 2000$	-100	-15	$\mu A$			
	I <sub>ADJ</sub>	36	36.25	-5	42.5	0	---	-3.625	---	---	---	---	---	"	$I_{ADJ} = E_{32} / 2000$	-100	-15	"			
	$\Delta I_{ADJ}$	37	---	---	---	---	---	---	---	---	---	---	---	"	$\Delta I_{ADJ} = (E_{31} - E_{32}) / 2000$	-5	5	"			
	$\Delta I_{ADJ}$	(LINE)	38	6.25	-5	15	0	---	-0.625	---	---	---	E <sub>33</sub>	"	$\Delta I_{ADJ} = (E_{33} - E_{34}) / 2000$	-5	5	"			
	$\Delta I_{ADJ}$	(LOAD)	39	6.25	-5000	15	-4.995	---	-0.625	---	---	---	E <sub>34</sub>	"	$\Delta I_{ADJ} = (E_{33} - E_{34}) / 2000$	-5	5	"			
	I <sub>OS1</sub>	40	4.25	---	15	---	---	-0.425	0	K4,K5	10-5	E <sub>35</sub>	V	LOS1 = 4E <sub>35</sub>	t = 0.1 ms	-16.0	-7.0	A			
	I <sub>OS2</sub>	41	4.25	---	15	---	---	-0.425	0	K4,K5	10-5	E <sub>36</sub>	V	LOS2 = 4E <sub>36</sub>	t = 0.5 ms	-16.0	-7.0	A			
	I <sub>OS3</sub>	42	4.25	---	15	---	---	-0.425	0	K4,K5	10-5	E <sub>37</sub>	V	LOS3 = 4E <sub>37</sub>	t = 5.0 ms	-15.0	-5.0	A			
	V <sub>OUT6</sub> (RECOV)	43	4.25	---	15	---	---	-0.425	15	K4,K5	9-11	E <sub>38</sub>	"	V <sub>OUT6</sub> = E <sub>38</sub>		1.19	1.29	V			
	I <sub>OS4</sub>	44	35	---	42.5	---	---	-3.5	0	K5	10-5	E <sub>39</sub>	"	I <sub>OS4</sub> = 4E <sub>39</sub>	t = 10.0 ms	-3.0	-0.20	A			
$T_A = +150^\circ C$	V <sub>OUT7</sub> (RECOV)	45	35	---	42.5	---	---	-3.5	15	K5	9-11	E <sub>40</sub>	"	V <sub>OUT7</sub> = E <sub>40</sub>	See figure 10 Waveforms	1.19	1.29	V			
	I <sub>Q1</sub>	46	4.25	---	15	0	1.4	-0.425	---	K3	12-13	E <sub>41</sub>	"	I <sub>Q1</sub> = E <sub>41</sub> / 2000		-3.0	-0.5	$\mu A$			
	I <sub>Q2</sub>	47	14.25	---	25	0	1.4	-1.425	---	K3	12-13	E <sub>42</sub>	"	I <sub>Q2</sub> = E <sub>42</sub> / 2000		-5.0	-0.5	"			
	I <sub>Q3</sub>	48	36.25	---	42.5	0	1.4	-3.625	---	K3	12-13	E <sub>43</sub>	"	I <sub>Q3</sub> = E <sub>43</sub> / 2000							
	V <sub>START</sub>	49	4.25	-5000	15	0	---	-0.425	---	K4	9-11	E <sub>44</sub>	"	V <sub>START</sub> = E <sub>44</sub>	See figure 10 Waveforms	1.19	1.29	V			
	V <sub>OUT7</sub>	50	6.25	-5	15	0	---	-0.625	---	None	"	E <sub>45</sub>	"	V <sub>OUT7</sub> = E <sub>45</sub>		1.19	1.29	V			
	V <sub>OUT1</sub>	51	4.25	-5	15	0	---	-0.425	---	None	9-11	E <sub>46</sub>	V	V <sub>OUT1</sub> = E <sub>46</sub>		1.19	1.29	V			
$T_A = -55^\circ C$	V <sub>OUT2</sub>	52	4.25	-5000	15	-4.995	---	-0.425	---	E <sub>47</sub>	"		"	V <sub>OUT2</sub> = E <sub>47</sub>		"	"	"			
	V <sub>OUT3</sub>	53	36.25	-5	42.5	0	---	-3.625	---	E <sub>48</sub>	"		"	V <sub>OUT3</sub> = E <sub>48</sub>		"	"	"			
	V <sub>OUT4</sub>	54	36.25	-0.150	42.5	-0.145	---	-3.625	---	E <sub>49</sub>	"		"	V <sub>OUT4</sub> = E <sub>49</sub>		"	"	"			
	V <sub>OUT5</sub>	55	6.25	-7000	15	-6.995	---	-0.625	---	E <sub>50</sub>	"		"	V <sub>OUT5</sub> = E <sub>50</sub>		"	"	"			
	V <sub>RLINE1</sub>	56	---	---	---	---	---	---	---	---	---			V <sub>RLINE</sub> = E <sub>46</sub> – E <sub>48</sub>	See figure 10 Waveforms	-17	17	mV			
$T_A = -55^\circ C$	VR <sub>LOAD1</sub>	57	6.25	-5	15	0	---	-0.625	---	E <sub>51</sub>	"		"	VR <sub>LOAD1</sub> = E <sub>51</sub> – E <sub>52</sub>	See figure 10 Waveforms	---	---	"			
	VR <sub>LOAD1</sub>	58	6.25	-5000	15	-4.995	---	-0.625	---	E <sub>52</sub>	"			VR <sub>LOAD1</sub> = E <sub>51</sub> – E <sub>52</sub>		---	8	8	"		
	VR <sub>LOAD2</sub>	59	---	---	---	---	---	---	---	E <sub>53</sub>	"			VR <sub>LOAD2</sub> = E <sub>48</sub> – E <sub>49</sub>		---	8	8	"		
	I <sub>ADJ</sub>	60	4.25	-5	15	0	---	-0.425	---	K2	12-13	E <sub>53</sub>	mV	I <sub>ADJ</sub> = E <sub>53</sub> / 2000		-100	-15	$\mu A$			
	I <sub>ADJ</sub>	61	36.25	-5	42.5	0	---	-3.625	---	E <sub>54</sub>	"			I <sub>ADJ</sub> = E <sub>54</sub> / 2000		-100	-15	"			
	$\Delta I_{ADJ}$	(LINE)	62	---	---	---	---	---	---	---	---			$\Delta I_{ADJ} = (E_{53} - E_{54}) / 2000$		-5	5	"			
	$\Delta I_{ADJ}$	(LOAD)	63	6.25	-5	15	0	---	-0.625	---	E <sub>55</sub>	"			$\Delta I_{ADJ} = (E_{55} - E_{56}) / 2000$		-5	5	"		
	$\Delta I_{ADJ}$	(LOAD)	64	6.25	-5000	15	-4.995	---	-0.625	---	E <sub>56</sub>	"			$\Delta I_{ADJ} = (E_{55} - E_{56}) / 2000$						

TABLE III. Group A inspection for all device type 06 – Continued.

Subgroup	Symbol	Test no.	Test conditions				See figure 10 Applied test voltages (Volts) (Hi – Lo pin potential)				Relays energized				Measurement sense limits				Equation		Notes	Limits	Unit			
			V <sub>IN</sub> (volts)	I <sub>L</sub> (mA)	1-2	4-5	6-11	7-2	8-2	K4,K5	10-5	E <sub>57</sub>	V	E <sub>58</sub>	"	E <sub>59</sub>	"	E <sub>60</sub>	t	0.1 ms	-16.0	-7.0	A			
$T_A = -55^{\circ}\text{C}$	I <sub>o1</sub>	65	4.25	---	15	---	---	-0.425	0	K4,K5	10-5	E <sub>57</sub>	V	I <sub>O1</sub> = 4E <sub>57</sub>				t = 0.1 ms	-16.0	-7.0	A					
	I <sub>o2</sub>	66	4.25	---	15	---	---	-0.425	0	K4,K5	10-5	E <sub>58</sub>	"	I <sub>O2</sub> = 4E <sub>58</sub>				t = 0.5 ms	-16.0	-7.0	A					
	I <sub>o3</sub>	67	4.25	---	15	---	---	-0.425	0	K4,K5	10-5	E <sub>59</sub>	"	I <sub>O3</sub> = 4E <sub>59</sub>				t = 5.0 ms	-15.0	-5.0	A					
	V <sub>OUT6</sub> (RECOV)	68	4.25	---	15	---	---	-0.425	15	K4,K5	9-11	E <sub>60</sub>	"	V <sub>OUT6</sub> = E <sub>60</sub>					1.19	1.29	V					
	I <sub>o4</sub>	69	35	---	42.5	---	---	-3.5	0	K5	10-5	E <sub>61</sub>	"	I <sub>O4</sub> = 4E <sub>61</sub>				t = 10.0 ms	-3.0	-0.20	A					
	V <sub>OUT7</sub> (RECOV)	70	35	---	42.5	---	---	-3.5	15	K5	9-11	E <sub>62</sub>	"	V <sub>OUT7</sub> = E <sub>62</sub>					1.19	1.29	V					
	I <sub>Q1</sub>	71	4.25	---	15	0	1.4	-0.425	---	K3	12-13	E <sub>63</sub>	"	I <sub>Q1</sub> = E <sub>63</sub> / 2000					-3.0	-0.5	mA					
	I <sub>Q2</sub>	72	14.25	---	25	0	1.4	-1.425	---	K3	12-13	E <sub>64</sub>	"	I <sub>Q2</sub> = E <sub>64</sub> / 2000					-3.0	-0.5	"					
	I <sub>Q3</sub>	73	36.25	---	42.5	0	1.4	-3.625	---	K3	12-13	E <sub>65</sub>	"	I <sub>Q3</sub> = E <sub>65</sub> / 2000					-5.0	-0.5	"					
	V <sub>START</sub>	74	4.25	-5000	15	0	---	-0.425	---	K4	9-11	E <sub>66</sub>	"	V <sub>START</sub> = E <sub>66</sub>					See figure 10 waveforms	1.19	1.29	V				
Subgroup	Symbol	Test no.	Test conditions								Measurement sense lines								Equation		Notes	Limits	Unit			
			Input voltage				Load current				Symbol				Value				Units							
			$V_{IN} = 6.25 \text{ V}$ $\epsilon_i = 1 \text{ V rms}$ at 2400 Hz				$I_L = -500 \text{ mA}$				$\epsilon_{rms}$				$\Delta V_{IN} / \Delta V_{OUT} = -20 \log E_{67}$				See figure 11					65	---	dB
			$V_{NO} = 6.25 \text{ V}$				$I_L = -100 \text{ mA}$				$\epsilon_{rms}$				$\Delta V_{IN} / \Delta V_{OUT} = E_{68}$				See figure 12					---	120	$\mu\text{V rms}$
			$\Delta V_{OUT} / \Delta V_{IN}$ $+25^{\circ}\text{C}$				$I_L = -10 \text{ mA}$				$\epsilon_{rms}$				$\Delta V_{OUT} / \Delta V_{IN} = E_{69} / 3$				See figure 13					---	12	$\text{mV/V}$
$\Delta V_{OUT} / \Delta I_L$ $+25^{\circ}\text{C}$				$I_L = -100 \text{ mA}$ $\Delta I_L = -400 \text{ mA}$				$V_{OUT}$				$\epsilon_{rms}$				$\Delta V_{OUT} / \Delta I_L = E_{70} / 200$		See figure 14		---	0.30	$\text{mV/mA}$				

TABLE IV. Group C end point electrical parameters. ( $T_A = +25^\circ\text{C}$ )

Device type	Characteristic	Symbol	Delta limits <u>1/</u>	Limits		Units
				Min	Max	
01, 02	Output voltage	$V_{\text{OUT}} \underline{2/}$	$\pm 50 \text{ mV}$	4.75	5.25	V
	Standby current drain	$I_{\text{SCD}}$	$\pm 20 \%$	-8.0	-0.5	mA
03, 04, 05	Output voltage	$V_{\text{OUT}} \underline{2/}$	$\pm 10 \text{ mV}$	1.20	1.30	V
06	Output voltage	$V_{\text{OUT}} \underline{2/}$	$\pm 10 \text{ mV}$	1.19	1.29	V
03, 04, 05, 06	Adjust pin current	$I_{\text{ADJ}} \underline{3/}$	$\pm 10 \mu\text{A}$	-100	-15	$\mu\text{A}$
03, 04	Line regulation	$V_{\text{RLINE}}$	$\pm 4 \text{ mV}$	-9	9	mV
05, 06	Line regulation	$V_{\text{RLINE}}$	$\pm 2 \text{ mV}$	-4	4	mV

1/ Delta limits apply to the measured value (see delta limit definition in MIL-PRF-38535).

2/ Delta limits apply to test number 3 for all device types.

3/ Delta limits apply to test number 11 for all device types 03, 04, 05 and test number 12 for device type 06.

## 5. PACKAGING

5.1 Packaging requirements. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Service or Defense Agency, or within the military's service system command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

## 6. NOTES

6.1 Intended use. Microcircuits conforming to this specification are intended for original equipment design applications and logistic support of existing equipment.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of the specification.
- b. Pin and compliance identifier, if applicable (see 1.2).
- c. Requirements for delivery of one copy of the conformance inspection data pertinent to the device inspection lot to be supplied with each shipment by the device manufacturer, if applicable.
- d. Requirements for certificate of compliance, if applicable.
- e. Requirements for notification of change of product or process to contracting activity in addition to notification to the qualifying activity, if applicable.
- f. Requirements for failure analysis (including required test condition of method 5003 of MIL-STD-883), corrective action, and reporting of results, if applicable.
- g. Requirements for product assurance options.
- h. Requirements for special carriers, lead lengths, or lead forming, if applicable. These requirements should not affect the part number. Unless otherwise specified, these requirements will not apply to direct purchase by or direct shipment to the Government.
- i. Requirements for "JAN" marking.
- j. Packaging requirements (see 5.1).

6.3 Superseding information. The requirements of MIL-M-38510 have been superseded to take advantage of the available Qualified Manufacturer Listing (QML) system provided by MIL-PRF-38535. Previous references to MIL-M-38510 in this document have been replaced by appropriate references to MIL-PRF-38535. All technical requirements now consist of this specification and MIL-PRF-38535. The MIL-M-38510 specification sheet number and PIN have been retained to avoid adversely impacting existing government logistics systems and contractor's parts lists.

6.4 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Manufacturers List QML-38535 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from DSCL-VQ, 3990 E. Broad Street, Columbus, Ohio 43123-1199.

6.5 Abbreviations, symbols, and definitions. The abbreviations, symbols, and definitions used herein are defined in MIL-PRF-38535, MIL-STD-1331, and as follows:

6.5.1 Line regulation. The change in output voltage for a specified change in input voltage ( $\Delta V_{LINE}$ ).

6.5.2 Load regulation. The change in output voltage for a specified change in load current ( $\Delta V_{LOAD}$ ).

6.5.3 Ripple rejection. The ratio of the peak to peak input ripple voltage to the peak to peak output ripple voltage ( $\Delta V_{OUT} / \Delta V_{IN}$ ).

6.5.4 Output noise voltage. The rms output noise voltage with constant load and no input ripple ( $V_{NO}$ ).

6.5.5 Standby current drain. The supply current drawn by the regulator with no output load or with a 1 k ohm output load.

6.5.6 Minimum load current. The minimum load current is that current required to maintain regulation.

6.5.7 Input voltage range. The range of supply voltage over which the regulator will operate.

6.5.8 Output voltage range. The range of output voltage over which the regulator will operate.

6.5.9 Transient response. The closed-loop step function response of the regulator under small-signal conditions.

6.6 Logistic support. Lead materials and finishes (see 3.4) are interchangeable. Unless otherwise specified, microcircuits acquired for Government logistic support will be acquired to device class B (see 1.2.2), lead material and finish A (see 3.4). Longer length leads and lead forming should not affect the part number.

6.7 Substitutability. The cross-reference information below is presented for the convenience of users. Microcircuits covered by this specification will functionally replace the listed generic-industry type. Generic-industry microcircuit types may not have equivalent operational performance characteristics across military temperature ranges or reliability factors equivalent to MIL-M-38510 device types and may have slight physical variations in relation to case size. The presence of this information should not be deemed as permitting substitution of generic-industry types for MIL-M-38510 types or as a waiver of any of the provisions of MIL-PRF-38535.

Military device type	Generic-industry type
01	78MG
02	78G
03	LM117H
04	LM117K
05	LM150K
06	LM138K

6.8 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue, due to the extensiveness of the changes.

Custodians:	Preparing activity:
Army - CR	DLA - CC
Navy - EC	
Air Force - 11	Project 5962-2013
DLA - CC	

Review activities:	
Army – MI, SM	
Navy – AS, CG, MC, SH, TD	
Air Force – 03, 19, 99	

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at [www.dodssp.daps.mil](http://www.dodssp.daps.mil).